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USER'S GUIDE FOR THE URBAN AIRSHED MODEL

Volume VIII:

User's Manual for the
Quality Assurance System

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NOTICE

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PREFACE

This user's guide for the Urban Airshed Model (UAM) is divided into seven volumes as follows:

Volume I	User's Manual for UAM (CB-IV)
Volume II	User's Manual for the UAM (CB-IV) Modeling System (Preprocessors)
Volume III	User's Manual for the Diagnostic Wind Model
Volume IV	User's Manual for the Emissions Processor System
Volume V	Description and Operation of the ROM-UAM Interface Program System
Volume VI	User's Manual for the Postprocessing System
Volume VII	User's Manual for the Performance Evaluation System
Volume VIII	User's Manual for the Quality Assurance System

Volume I provides historical background on the model and describes in general the scientific basis for the model. For those users that already possess a UAM modeling database or have prepared inputs without the use of the standard UAM preprocessors, this volume should serve as a self-sufficient guide to running the model.

Volume II describes the file formats and software for each of the standard UAM preprocessors that are part of the UAM modeling system. Included in this volume is an example problem that illustrates how inputs were created from measurement data for an application of the UAM in Atlanta.

Volume III is the user's manual for the Diagnostic Wind Model (DWM). This model is a stand-alone interpolative wind model that uses surface- and upper-level wind observations at selected sites within the modeling domain of interest to provide hourly, gridded, three-dimensional estimates of winds using objective techniques. It provides one means of formulating wind fields of the UAM.

Volume IV describes in detail the Emissions Processor System 2.0 (EPS 2.0). This software package is used to process anthropogenic area and point source emissions for the UAM. Volume IV consists of two parts. Part A describes the core FORTRAN modules and utility programs of EPS 2.0 as well as the UAM Biogenic Emissions Inventory System (BEIS), which can be used to generate gridded, speciated biogenic emissions. Part B describes the EPS 2.0 Interface and Emission Display System.

Volume V describes the ROM-UAM interface program system, a software package that can be used to generate UAM input files from inputs and outputs provided by the EPA Regional Oxidant Model (ROM).

Volume VI is the user's manual for the Postprocessing System (PPS). The UAM Postprocessing System (UAMPPS) is a data display and analysis tool for evaluating emission control strategies. After executing the UAM system, the results from one or more model runs may be graphically compared. The UAMPPS creates time-series plots, tile maps, gridded value maps, bar charts, box plots, scatter plots, and quantile plots. Through a series of menus, the user has a wide range of flexibility in scaling and labelling the graphs.

Volume VII is the user's manual for the Performance Evaluation System (PES). The UAM Performance Evaluation System (UAMPES) is a data display and analysis tool, which allows statistical and graphical comparisons between UAM predictions and actual observations contained in the Aerometric Information Retrieval System. These comparisons allow users to evaluate UAM performance. The variety of graphs and the system of menus used to create the graphs are similar to the UAMPPS. Experience acquired in using the UAMPPS should facilitate the use of the UAMPES.

Volume VIII is the user's manual for the Quality Assurance System (QAS). The UAM Quality Assurance System is a display and analysis tool for input data to the UAM core model, which enables the user to display data from any of nine UAM input files: AIRQUALITY, DIFFBREAK, EMISSIONS, METSCALARS, REGIONTOP, TEMPERATURE, TERRAIN, TOPCONC AND WIND. Through a series of menus the user has a wide range of flexibility in scaling and labeling time series plots, tilemaps, wind vector charts, and three-dimensional bubble plots.

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1. INTRODUCTION

This manual describes the procedures for using the Quality Assurance System of the Urban Airshed Model (UAM). This section summarizes the purpose and features of the Quality Assurance System and outlines the organization of the rest of the manual.

1.1 BACKGROUND

The 1990 Clean Air Act Amendments require all States with ozone nonattainment areas to submit a State Implementation Plan (SIP), which will explain the emissions control methods that each State plans to implement to achieve attainment. A concurrent requirement for some areas is to deliver a UAM modeling demonstration in support of the SIP.

The U.S. Environmental Protection Agency (EPA) issued guidance (EPA, 1991a) that provides recommendations and general procedures for exercising the UAM in regulatory applications. In particular, Chapter 5 of the UAM guideline document describes a set of performance statistics and graphical procedures that are useful to assess the accuracy of UAM in predicting ozone levels in specific applications areas.

The UAM Quality Assurance System (UAMQAS) will provide assistance in quality control of the data to be used as input to the UAM. The UAMQAS enables users to graphically display UAM input data and to print the extracted information in tabular format.

The UAMQAS graphics module is designed to use data sets generated by the UAMQAS extract module. These data sets contain varying combinations of data including pollutants, geographical area, layer height, wind speed and direction and time frame. In spatial graphics, a 3-dimensional Cartesian grid is laid over the geographical area. The data set contains values for each grid cell in the layer of cells selected by the user.

1.2 THE UAMQAS

The UAMQAS is available on the IBM computer systems at the EPA National Computer Center (NCC) and the Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network Support Center for Regulatory Air Models (TTN SCRAM) bulletin board and may be used or obtained by anyone with access to those systems. The UAMQAS uses menus to elicit necessary information for producing the graphics. The menus enable even novice users to execute the UAMQAS.

1.3 ORGANIZATION OF THIS MANUAL

The following sections of this manual provide the information necessary for using the UAMQAS.

- Section 2 describes the features and characteristics of the UAMQAS.
- Section 3 describes the equipment you need and how to start the UAMQAS.
- Section 4 is a tutorial that illustrates a typical session.
- Section 5 describes each menu and how to use it.
- Section 6 describes the ways in which the output may be stored and/or printed.

1.4 FOR MORE INFORMATION

This manual provides complete instructions for using the UAMQAS, but it does not attempt to cover other topics. For additional information contact the sources listed below.

More information about the data extraction is given in Appendix A; this appendix is similar in content to Section 4.1 of the user's manual for the UAM postprocessing system (EPA, 1990a).

For more information about using the IBM computer system at the NCC, or for help with IBM computer-related problems, contact the EPA User Support Department. Specialists are on duty weekdays 8:00 a.m. through 7:00 p.m. eastern time to help solve problems and to answer questions. The mailing address and telephone numbers are:

User Support Department, MD-34
EPA National Computer Center
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711
Telephone: (919) 541-7862 or (800) 334-2405

1.5 CONVENTIONS USED IN THIS MANUAL

The conventions listed in Table 1-1 are used in this manual.

Table 1-1. Conventions Used In This Manual

Convention	Description
UAMQAS Main Menu	*Italics* indicate names of menus
Select	**Boldface** lowercase words indicate a menu field
<PF13>	< > characters indicate a terminal key.

2. OVERVIEW

The UAMQAS generates graphics that can be used to evaluate the accuracy of UAM input data. This section discusses the graphics that are available in the UAMQAS.

2.1 INTRODUCTION

The UAMQAS provides an automated method of displaying data from any of nine UAM input files. These files are named AIRQUALITY, DIFFBREAK, EMISSIONS, METSCALARS, REGIONTOP, TEMPERATUR, TERRAIN, TOPCONC, and WIND. Section 2.2 and section 2.3 presents an overview of the graphical components of the UAMQAS. Section 2.4 discusses the overview of the tables created within UAMQAS. Examples of the graphics and tables are presented in section 2.5.

2.2 GRAPHICAL PERFORMANCE PROCEDURES

The UAMQAS enables users to create four categories of graphs. These are: spatial graphics, temporal graphics, wind vector charts, and three-dimensional bubble plots. Each of the graphic displays is described in more detail in the remainder of section 2 of this document.

2.2.1 Spatial Graphics

Spatial graphics are available for the following UAM input files: AIRQUALITY, EMISSIONS, TEMPERATUR, TERRAIN, and TOPCONC. Spatial graphics present the grid cells associated with the input data overlaid on a map of the state and county lines of the geographical area. There are four types of spatial graphics, average value for a given time period, maximum value for a given time period, hour at which the maximum occurs during a given time period, and value at a given hour. The first three types (MAP1, MAP2, and MAP3) consider values over a time period, or range of hours, specified in the *Data File Selection Menu*. If the user specifies a range of 24 hours, the first type of spatial graphic averages the 24 values for each grid cell and reports the result. Similarly, the second type locates and reports the maximum value over 24 hours for each grid cell. The third type reports the hour at which that maximum occurred, recognizing that the maximum may occur at different hours in different grid cells. The fourth type (MAP4) reports cell values for a single hour specified by the user.

There are two different display options for each of the four spatial graphic types. In the shaded tile map, in each grid cell (or tile) can be a different color or shade depending on the predicted value recorded in the extracted data set. In the gridded value map, the numerical representation of the predicted value is plotted at each grid cell location.

There are three general ways to vary the two different display options for spatial graphics:

(1) You may select either a color or monochrome plot.

(2) You may annotate the grid divisions with either column and row numbers derived from the UTM coordinate system or latitude and longitude values. You may also choose to have no grid division annotation.

(3) You may choose to annotate city names and locations. If you decide to annotate cities, you may choose all the cities in the SAS map database or you may select a subset of those cities to annotate. If you have already selected a subset of cities you may also choose to simply repeat the previously selected subset.

2.2.2 Time-Series Line Graphs

Time-series line graphs may be plotted for three of the UAM input files: METSCALARS, DIFFBREAK, and REGIONTOP. There are five different parameters contained in the METSCALARS files. Each of these parameters will be plotted separately. The temperature gradient parameter will generate two lines, one for the temperature gradient above the diffusion break, and one for the temperature gradient below the diffusion break. The other four parameters will generate a single line. DIFFBREAK and REGIONTOP files each generate a single line. The system allows combined plots of DIFFBREAK and REGIONTOP data, or either one may be plotted separately.

2.2.3 Wind Vector Charts

Wind vector charts are available for the WIND input file. These graphs are overlaid on a map of the geographical area similar to the spatial graphics, but instead of shaded tiles, a vector is plotted for each grid cell. Each vector is pointing in the direction in which the wind is going, and the length of each vector is proportional to the wind speed indicated by the data.

2.2.4 Three-Dimensional Bubble Plots

Three-dimensional bubble plots are available for the same input files as the spatial graphics, namely, AIRQUALITY, EMISSIONS, TEMPERATUR, TERRAIN, and TOPCONC. These plots represent the data in three dimensions along x-, y-, and z-axes. The x-, and y-axes are the same as the rows and columns represented in spatial graphics. The z-axis is proportional

to the values being plotted. For example, when plotting an AIRQUALITY file the z-axis indicates the value of the concentrations. Each data point is represented as a bubble, or circle, whose size is also proportional to the value being plotted. Needles are vertical lines drawn from each bubble to the surface of the x-y plane, and may aid in showing the relative position of the bubbles.

2.3 GRAPHICS ELEMENTS

The graphics produced by the UAMQAS generally have five elements in common. These elements are titles, x and y axes, axis labels, legends, and graphics labels.

- Titles are located at the top of the graphic and provide general information about the data used. The title information includes, but is not limited to, the species of pollutant and the location and time frame of the study.
- The x (horizontal) and y (vertical) axes frame the bottom and left side of the plot and indicate the scale of the units being plotted.
- The axis labels are oriented along their respective axes and describe the units that are scaled along each axis.
- The legend is enclosed in a box located below the x-axis label. The legend provides a key to the symbols used in the plot.
- The graphics label is located in the lower right corner and provides a quick reference to tie together the graphics, the tables that accompany them, and their description in this manual.

2.4 DATA TABLES

Every graphic generates a table containing the data points used to create the graphic. These tables are not displayed to the user, but are saved in a text file to allow the user to view the data at a later time. The tables are appended to the text file until the user ends the UAMQAS session. There are three different types of tables generated. Spatial and 3-dimensional graphics create a table of the data values plotted in the grid cells. The table labels each column and row and prints the value plotted at each grid point. The table uses the same title and label as the graphic that was generated. The tables generated for wind plots are very similar to those for spatial plots. The wind table also labels each column and row, but prints the wind speed and the wind direction at each grid cell. These tables only use the same title as the wind graphic that was created. The last type of table created is for the temporal graphics. This table lists the date and hour as well as the data value for that

hour. The temporal table also only uses the same title as the graphic. The print file is explained in more detail in secion 5.5.2 and the tables are explained in more detail in section 6.3.

2.5 EXAMPLES OF GRAPHICS AND TABLES

The UAMQAS can generate four types of graphics: spatial, temporal, wind vector, and three-dimensional and tables of the data used to create the selected graphic. Figures 2-1 through 2-5 show examples of these graphics and tables.

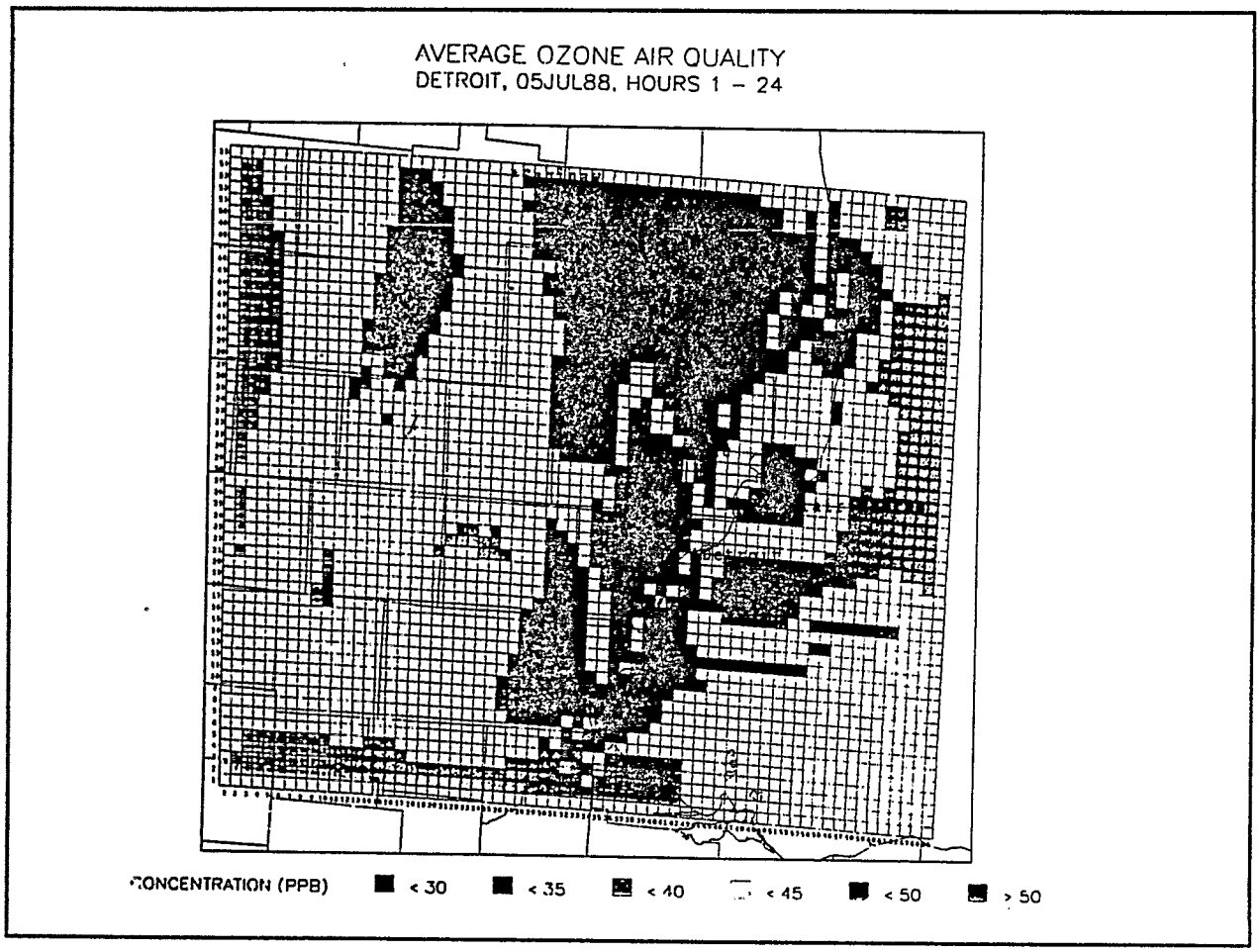


Figure 2-1. *Example of a Spatial Graphic*

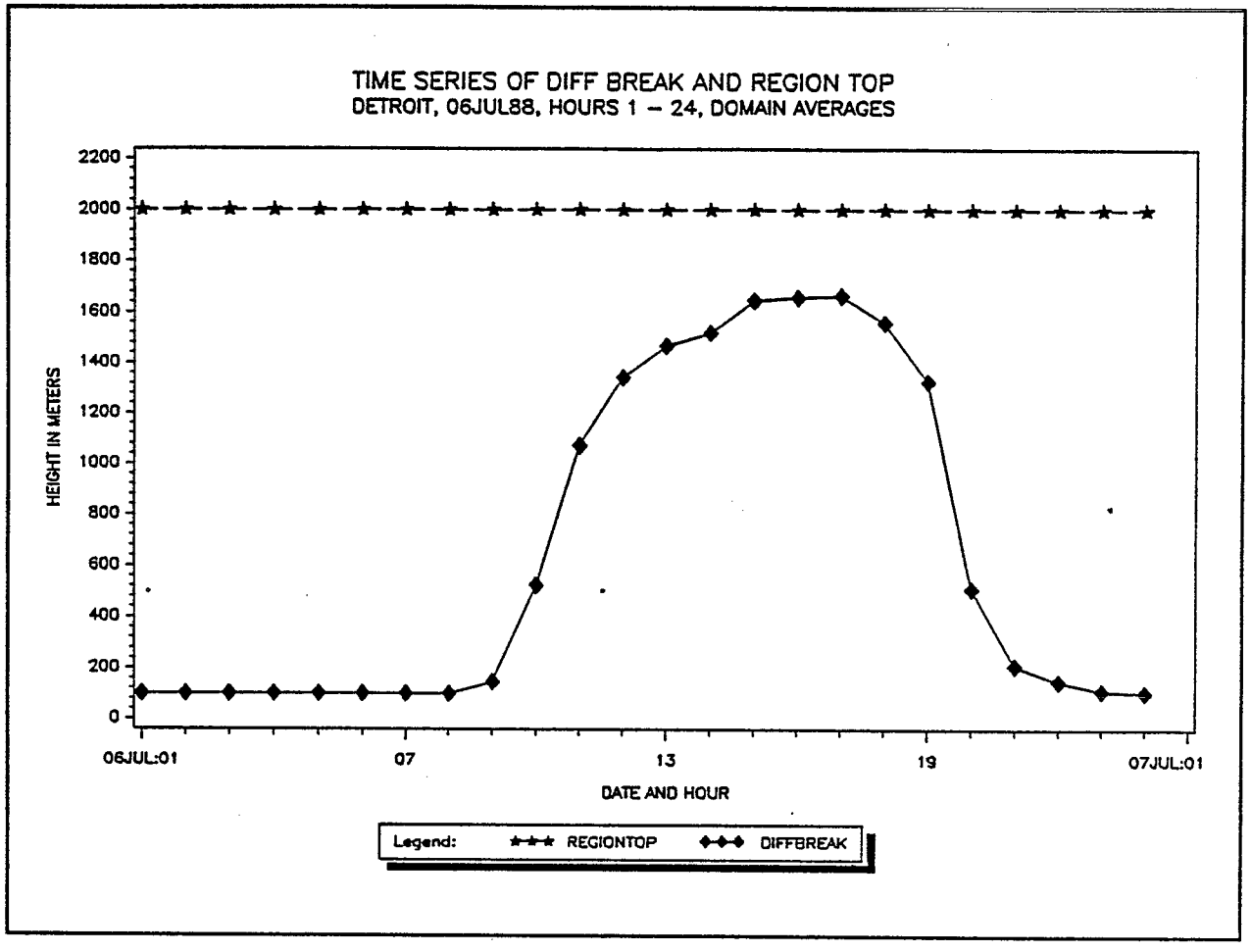


Figure 2-2. *Example of a Temporal Graphic.*

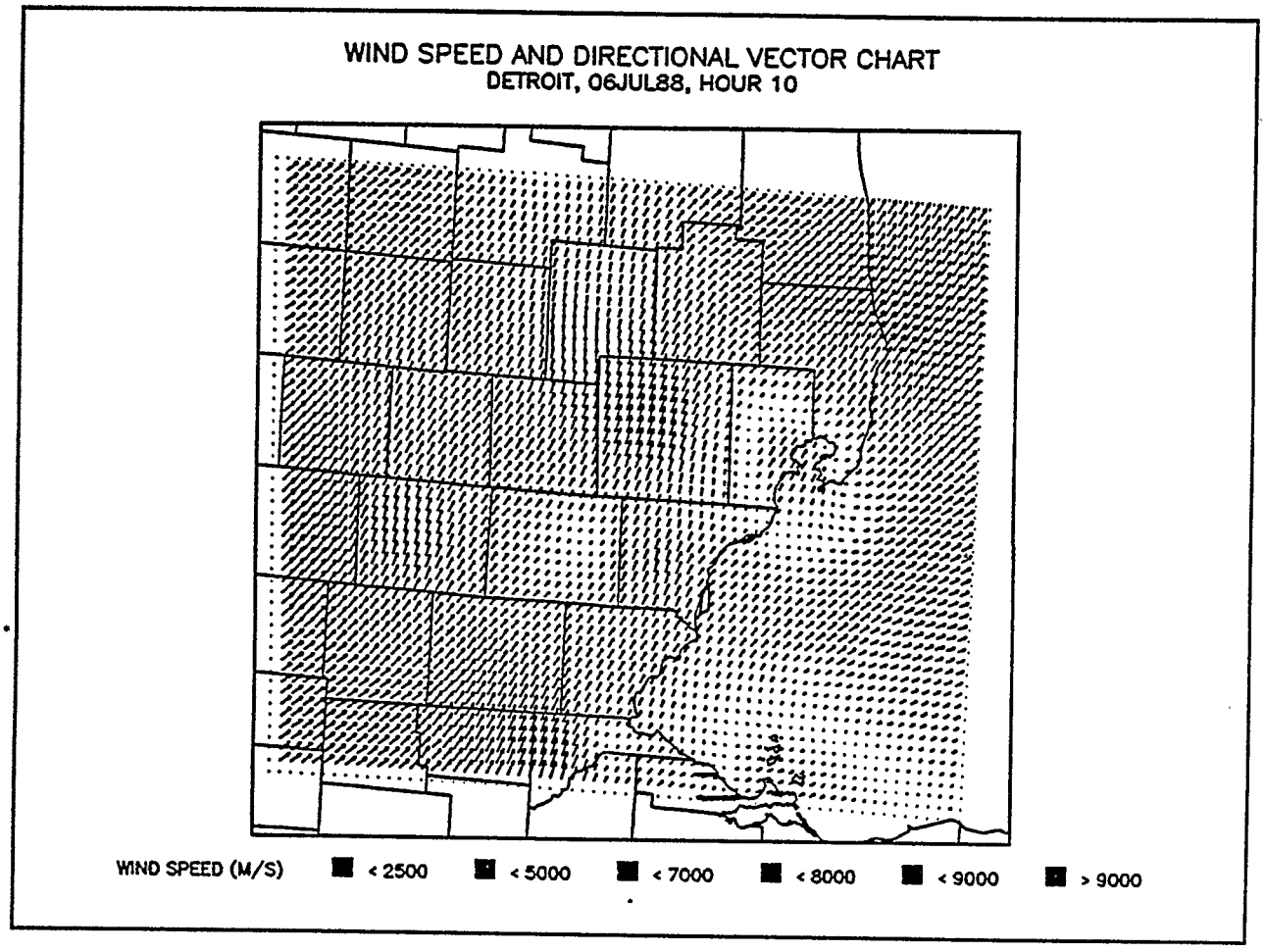


Figure 2-3. *Example of a Wind Vector Chart.*

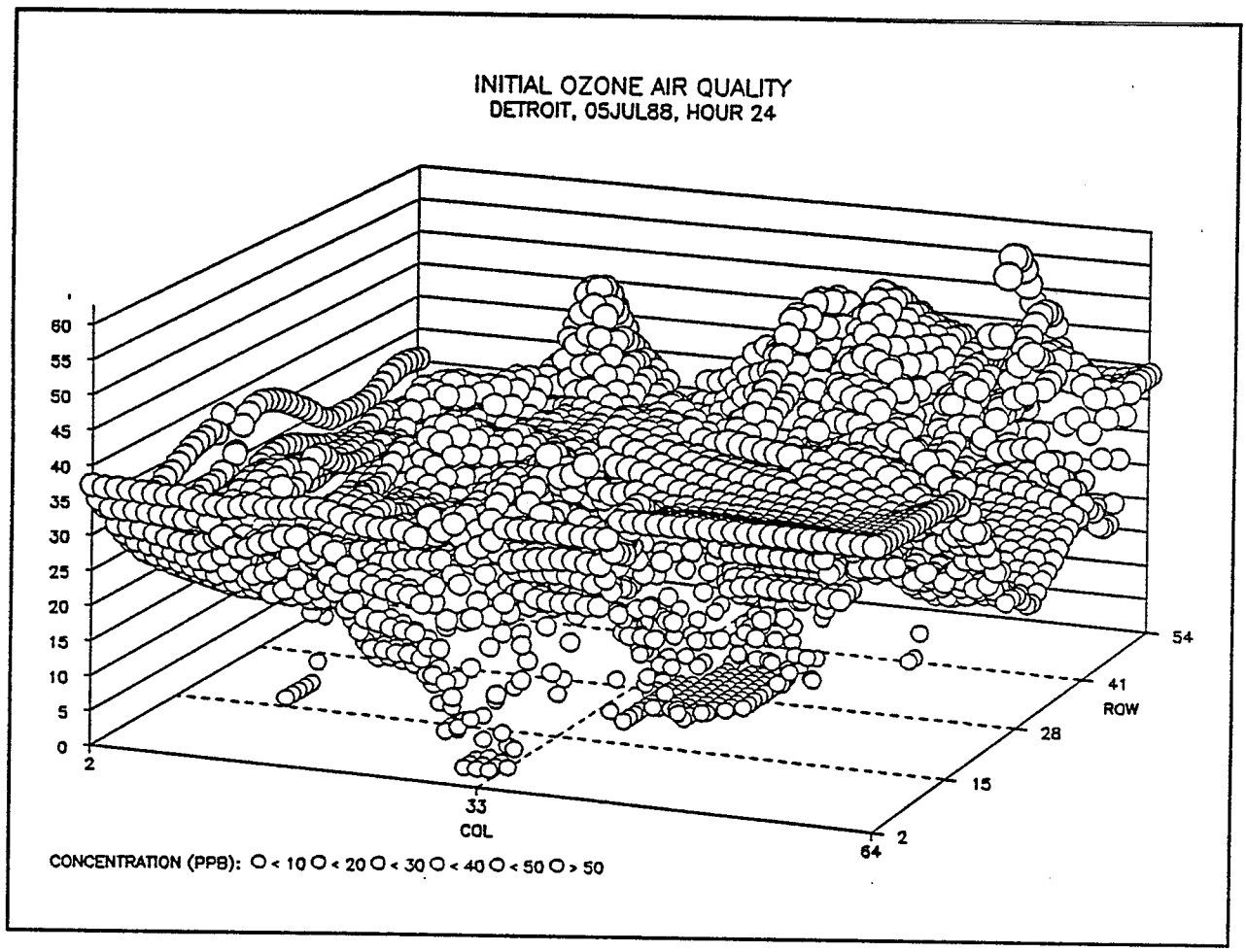


Figure 2-4. *Example of a Three-Dimensional Bubble Plot.*

TIME SERIES OF DIFF BREAK AND REGION TOP
DETROIT, 06JUL88, HOURS 1 - 24, DOMAIN AVERAGES

OBS	Date:Hour	Region Top Values	Diffusion Break Values
1	06JUL88:01	2000	100.00
2	06JUL88:02	2000	100.00
3	06JUL88:03	2000	100.00
4	06JUL88:04	2000	100.00
5	06JUL88:05	2000	100.00
6	06JUL88:06	2000	100.00
7	06JUL88:07	2000	100.00
8	06JUL88:08	2000	100.00
9	06JUL88:09	2000	145.33
10	06JUL88:10	2000	522.65
11	06JUL88:11	2000	1070.79
12	06JUL88:12	2000	1341.08
13	06JUL88:13	2000	1466.24
14	06JUL88:14	2000	1517.02
15	06JUL88:15	2000	1645.37
16	06JUL88:16	2000	1656.94
17	06JUL88:17	2000	1663.43
18	06JUL88:18	2000	1555.38
19	06JUL88:19	2000	1324.44
20	06JUL88:20	2000	508.83
21	06JUL88:21	2000	210.02
22	06JUL88:22	2000	147.41
23	06JUL88:23	2000	110.67
24	07JUL88:00	2000	103.65

Figure 2-5. *Example of a data table for a temporal graphic.*

3. PROCEDURES

The UAMQAS runs on the IBM computer system at the EPA National Computer Center (NCC, Research Triangle Park, NC). This section explains what authorization you need, what equipment is required and/or supported, how to start, and how to use system menus.

3.1 AUTHORIZATION

There are no restrictions on the use of the UAMQAS on EPA's IBM computer system at the NCC. You will need access to the standard facilities of the IBM computer system and the Time-Sharing Option (TSO). The TSO (the interactive part of the IBM computer operating system) is the environment in which the UAMQAS menus operate. If you are not a registered user of EPA's IBM computer system, States may get information about registration procedures from the modeling contact for their EPA Region. Others may contact the EPA's NCC User Support Department identified in section 1.4 of this manual.

3.2 EQUIPMENT

The UAMQAS uses full-screen menus (i.e., the computer system and the terminal exchange data in screen-sized segments, rather than a line at a time or character-by-character). You must use a terminal that supports this full-screen protocol, or use equipment that emulates such a terminal. Also, your terminal must support full-screen graphics to display the graphics produced by the UAMQAS. If your terminal does not support full-screen graphics, you will need to save the graphics in a catalog (explained in Appendix B) and send the graphics from the catalog to a printer or other hard-copy device. In other words, the graphics can not be viewed on the screen. However, they may be generated, stored, and sent to a plotter.

The UAMQAS is designed to support, or produce, graphics on a variety of graphics terminals and hard-copy devices. If you do not have a full-screen terminal, you can emulate one using an asynchronous terminal or its equivalent [e.g., a personal computer (PC) equipped with a modem and appropriate communications software]. The computer system on which the UAMQAS is installed must have a protocol converter (i.e., equipment that converts the character-by-character communications protocol of an asynchronous terminal to the full-screen protocol required for the UAMQAS menus). For a PC/modem emulation to work acceptably, the PC communications software must provide a way to make some keys

on the PC keyboard equivalent to the program function (PF) keys on full-screen terminals. Your terminal must be able to emulate PF keys to use the UAMQAS menus.

For more information about terminals or terminal emulations, get in touch with the modeling contact for your EPA Region or the user support department of the computer system on which the UAMQAS is installed.

3.3 GETTING STARTED

Before you use the UAMQAS, you must log on to the TSO of the IBM computer system in full-screen mode. If you need help doing this, read the *Getting Started* chapter of the *Guide to NCC Services* (EPA, 1990b). This guide is distributed to new users of the NCC when they register, and current users can request a copy from the EPA User Support Department. Unfortunately, if you are using an asynchronous terminal or a PC with a modem, the guide is not very clear about the procedure for connecting to the system in the full-screen emulation mode. If you need help, get in touch with the modeling contact for your EPA Region, or call the EPA User Support Department of the NCC (see Section 1 in this manual).

After you have completed the log-on and the TSO has displayed its READY prompt, you are ready to invoke the UAMQAS by entering "UAMQAS" (in lowercase or uppercase letters). Press <Enter> to transmit the command to the computer and start the UAMQAS. There will be a short pause while the software is loaded and initialized. When the *UAMQAS Main Menu* emerges (Figure 3-1), the UAMQAS is active.

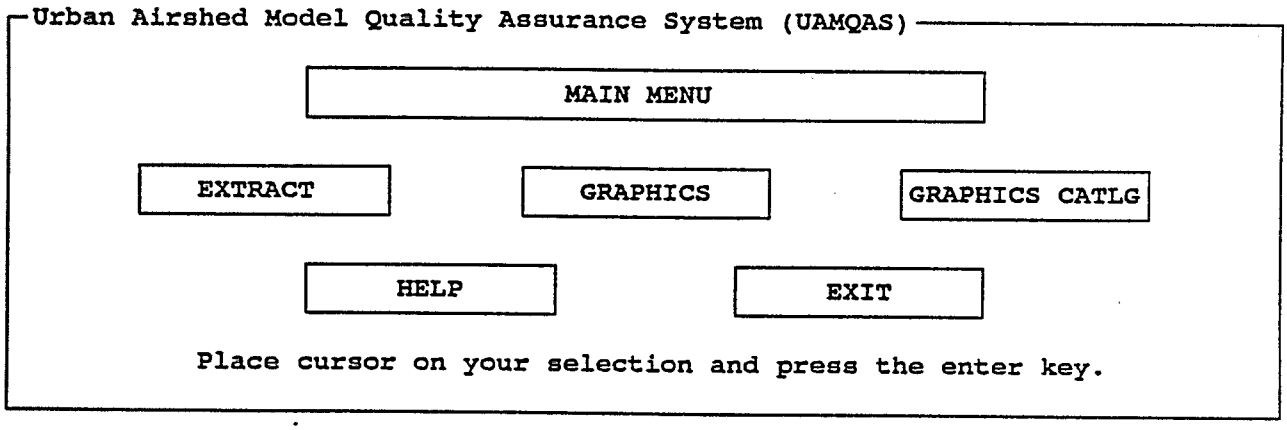


Figure 3-1. *UAMQAS Main Menu.*

In section 3.4, we describe general procedures for using all UAMQAS menus. Section 4 uses an example to illustrate the procedures and menus that you can use to produce a graph. Section 5 describes the sequence of menus and provides details for each menu.

3.4 USING MENUS

The UAMQAS menus make it easy to produce graphics for evaluating inputs to the UAM. The procedure is described in the steps below.

(1) A menu appears on your screen and prompts you for certain information. You need to supply the requested information and press <Enter>.

(2) Press <Enter>. This keystroke will tell the menu program, "I'm done here. Go on to the next operation." The menu program then checks the information for errors, omissions, or inconsistencies and reports any problems it finds.

(3) You need to fix the problems, press <Enter>, and the next menu will appear.

Steps 1 through 3 are repeated for each menu that is required to define your graphic. After all the specifications are assembled, the last menu program produces a graphic which will be displayed on your terminal and/or saved in a graphics catalog.

Figure 3-2 shows an example menu that illustrates many of the features of the UAMQAS menus.

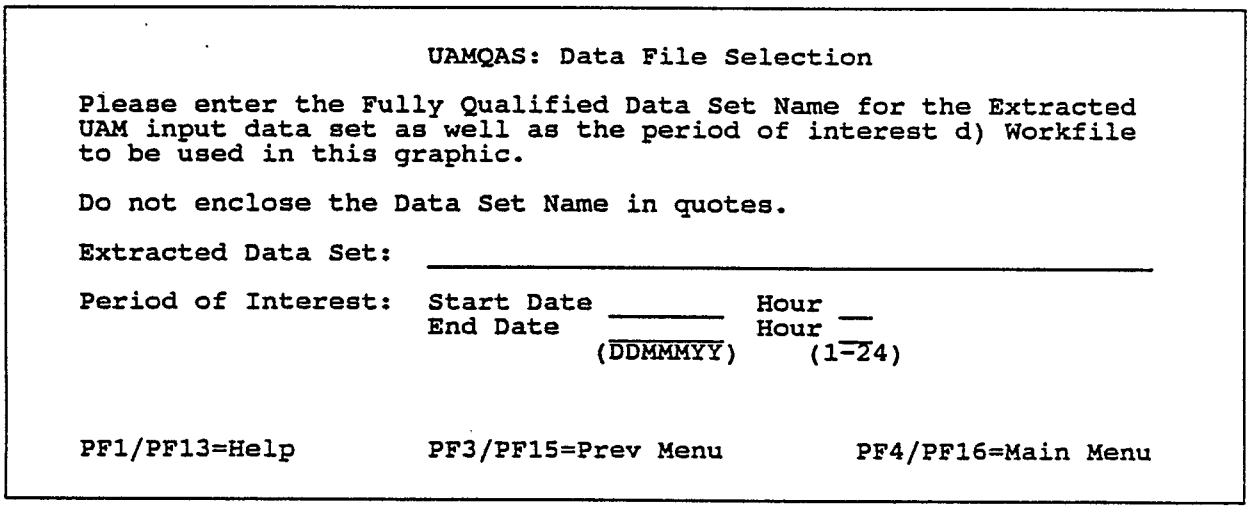


Figure 3-2. *Example UAMQAS menu.*

The following paragraphs describe the menu features and how to use them.

- Identification Every UAMQAS menu has a number in the top left corner that uniquely identifies it, and one or two title lines at the top of the screen that summarize the menu's purpose or function. In Figure 3-2, the identifying number is 2.2. The method for assigning menu numbers is discussed in Section 5 (Menu Reference). The title line, *Data File Selection*, identifies the general function and purpose.

- Instructions Not all menus contain instructions. In the menus that contain instructions, the lines of text below the menu title explain what you are expected to do (see Figure 3-2). In the menus that do not contain instructions, the required action should be self-evident (see Figure 3-3). The specific instructions vary from one menu to another, but there are two general actions: fill in a blank or select from a list. In Figure 3-2, the instructions describe filling in blanks. However, in Figure 3-3, you are expected to select from the list presented and enter the number of your selection in the accompanying blank.

- Cursor Movement When a menu is first displayed on your terminal, the cursor will appear at the beginning of the first selection/specification field. Pressing the <Tab> key moves the cursor from one field to the next. The cursor will automatically move to the next field if your entry in the previous field completely fills the space allotted to that field. If your terminal has a <Reverse-tab> or <Back-tab> key, pressing it moves the cursor to the previous field. You can also use the terminal's cursor movement (arrow) keys to move the cursor to a field, but using the <Tab> key is quicker.

- Selection Fields There are a few types of selection fields that can appear on a menu. The first displays the list of values in the middle or bottom of a menu for you to choose from and enter your selection in the appropriate field. The menu in Figure 3-3 displays choices. The fields (beside the words **Map Type:**, **Pattern Type:**, **Grid Annotation:**, **City Annotation:**, and **Analysis:**) will accept values that you enter to fill in the blank field or replace the initial values. (These fields will be blank the first time that you run the system, or will contain initial values from the previous run.) Some menus contain fields that are linked to a separate list of valid values. These selection lists can be made available by placing a question mark (?) in the field and pressing <Enter>. The list will be displayed in a window on top of the current menu. Use <Tab> to move the cursor down the list to the value you wish to choose and press <Enter>. The program will automatically transfer your selection back to the current menu and fill in the field for you. The last type of selection list is a menu that displays a list of values from which you are to choose as many as you wish by entering an "S" in the **Select** field. Figure 3-5 is an example of this type of selection menu. Press the

<Tab> to scroll down the list and place an "S" in all Select fields for all the values you wish to choose. When you are finished, press PF3/PF15 to save the selections and continue with the program.

```
2.3
                    UAMQAS: Spatial Graphic Selection

          Map Type: 1  1) Shaded Tile    2) Gridded Value

       Pattern Type: 1  1) Color         2) Monochrome

    Grid Annotation: 1  1) None          2) Col/Row        3) Lat/Lon

    City Annotation: 1  1) None  2) All  3) Subset Cities  4) Prev Subset

            Analysis: 1  1) Average Values
                         2) Maximum Values
                         3) Hour of Maximum Value
                         4) Value at a Given Hour

    PF/1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

Figure 3-3. *Example UAMQAS menu without instructions.*

- Protected Fields The areas of the screen that are skipped over when you press <Tab> are protected; you cannot alter them. If you move the cursor with cursor-movement keys to a protected part of the screen and try to alter it, the terminal keyboard locks and you must press the <Reset> key to regain use of it. If your keyboard does not have a <Reset> key, contact the EPA User Support Department (see Section 1).

  Menu titles, instructions, "white space", etc. are protected areas. Sometimes an area of a menu that looks like a fill-in-the-blank field with an initial value is a protected field. The menu program determines that only one value is valid for the field, inserts that value for you, and makes the field protected. In general, if you can tab the cursor to a field, it has an initial value that can be changed. If you cannot tab to it, the field is protected.

- PF Keys Table 3-1 (on the next page) lists the standard PF-key functions. The CANCEL function, <PF3> or <PF15>, is available on every menu. It lets you return to a previous menu or exit from the UAMQAS without producing a graph. The ABORT function, <PF4> or <PF16>, is available on every menu except the *UAMQAS Main Menu*. It is a quick way to abandon a graphics request and return to the *UAMQAS Main Menu*, but your menu choices are not saved.

Some warning messages may occur if you end a UAMQAS session using the ABORT function. The SCROLL functions listed in Table 3-1 are meaningful only on menus that display an item list or information that does not completely fit on one screen.

Table 3-1. PF-Key Functions For UAMQAS Menus

PF Key	Command	Assigned Function
PF1 or PF13 [a]	**HELP**	Provides context-sensitive information on how to proceed or indicates what information is required.
PF3 or PF15 [a]	**CANCEL**	Terminates the current menu without taking any action and returns to the previous menu.
PF4 or PF16 [a]	**ABORT**	Terminates the current menu without taking any action and returns to the *UAMQAS Main Menu*.
PF7 or PF19 [b]	**BACKWARD**	Scrolls toward the beginning of a list of items.
PF8 or PF20 [b]	**FORWARD**	Scrolls toward the end of a list of items.

[a] These PF keys are available on all menus except the main menu.
[b] These PF keys are available on menus that contain a list that is too long to fit on one screen.

- Error Messages Error messages will appear within a narrow horizontal window in the middle of the screen if something is wrong. On color terminals, the window will have a red, flashing border. If you make a mistake when using the UAMQAS menus, this window will appear. If a menu program detects something wrong, it describes the problem in a one-line message that appears after you press <Enter> from your terminal. In Figure 3-4, a message appeared because the value "5" is entered in the Type field. Only the values "1", "2", "3", or "4" are valid choices in this field.

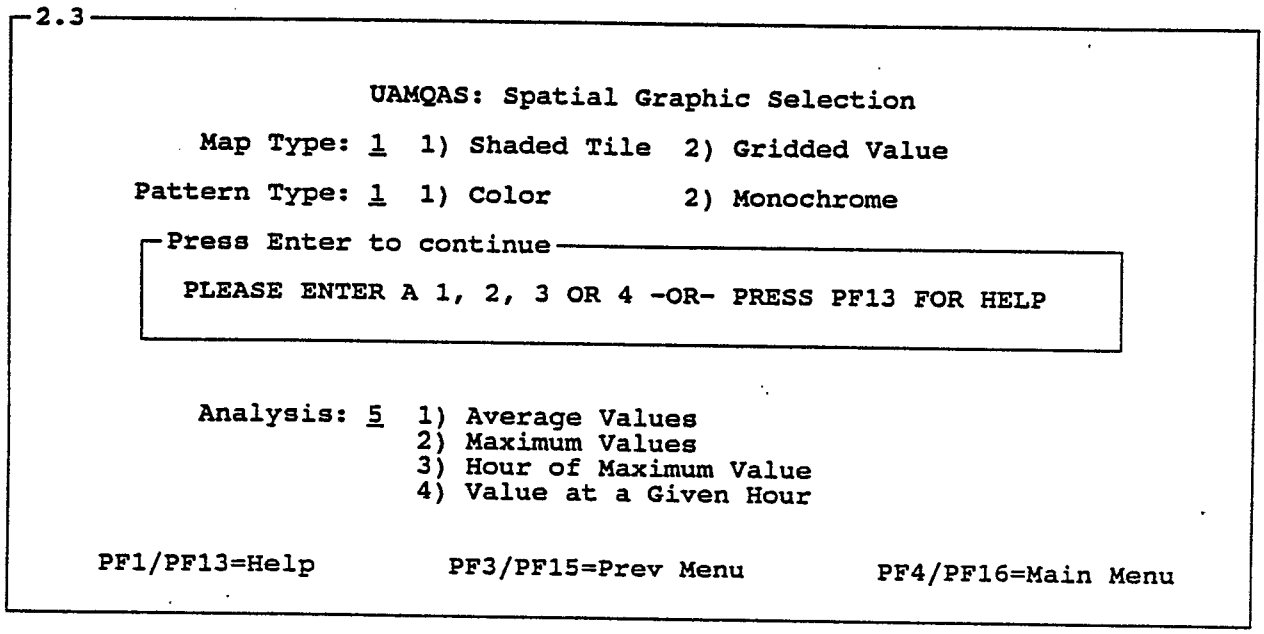


Figure 3-4. *Example UAMQAS menu with error message.*

- Error Correction First, press <Enter> to remove the error message from the screen. Fill-in-the-blank fields associated with an error are highlighted. If there are multiple errors, the error message describes only the first one and highlights the field associated with that error. You should change that field to eliminate the error. Then, press <Enter>. If there is more than one error, another error message will appear indicating what else needs to be done. In some instances an error condition involves two or more fields, and you may need to decide which of them is the real culprit, that is, the one causing the error. Press <Enter> after each correction. After no more corrections are needed, press <Enter> to move on to the next step in the program.

- Scrolling Some menus have a list of items to choose from. The menu shown in Figure 3-5 below displays a list of cities which may be selected by entering an "S" in the **Select** field. If the entire list does not fit on the screen, you can scroll to see more items. Imagine that part of the menu is a window through which you see the list of items. Scrolling forward is like sliding the window down, toward the end of the list. Scrolling backward is like sliding the window up, toward the beginning of the list. Scrolling backward at the beginning of a list has no effect, nor does scrolling forward at the end of a list. The PF keys for scrolling are defined in Table 3-1.

```
                UAMQAS: Cities Located Within Domain

Place an S in the selection column for all cities to be displayed on map.
        Press PF20 to scroll down the list, PF19 to scroll up.
   After all selections have been made, press PF15 to save selections.

                Selection          City

                    S          *BRIDGEPORT
                               *BRISTOL
                    _          *DANBURY
                    _          *FAIRFIELD
                    _          *GREENWICH
                    _          *HAMDEN
                    S          *HARTFORD
                    S          *MANCHESTER
                    _          *MERIDEN
                    _          *MILFORD
```

Figure 3-5. *Example UAMQAS selection menu with a scrollable list.*

- Field Values Saved and Recalled The first time you use a menu, the fields in which you can enter values are blank. Underlines indicate the locations and sizes of blank fields. When you leave a particular menu, the UAMQAS saves the values of all fill-in-the-blank fields, but not the selections you make from a scrollable list. The next time you use the same menu, the values you entered are displayed as the initial values. If you want to use the same values again, you do not have to reenter them. To override any defaults, type over the field and eliminate any extraneous characters using either the <Space bar> or the <Erase EOF> or <Del> keys.

- On-line Help On-line help is available from most screen fields. To access on-line help, simply place the cursor on the field for which help is desired and press <PF1> or <PF13>. A window with an explanation and additional information on the field will open on top of the menu. The help window may be one screen or multiple screens, depending on the field and the complexity of the related information. From the help window, press <PF3> or <PF15> to return to the application screen and continue your data entry.

- Colors on Menus If you are using a terminal that supports color graphics, you may notice that different types of information are displayed in different colors. The text describing a given field is displayed in cyan. If the field is protected, the color of the field will be pink. Fields that require a response from you are displayed in green; system errors or informational messages are displayed in red. If the system detects that an invalid value has been entered in a field, that field will be displayed in white and reverse video. If a monochrome terminal is used, no colors will be displayed; however, if an error is detected, the terminal will most likely display the field in reverse video.

4. TUTORIAL

This section illustrates a typical UAMQAS session. It shows how the menus will look when you use the UAMQAS, and how the menus respond to common mistakes. You can run this tutorial on your own terminal by entering the values and commands given in the text.

4.1 STARTING THE UAMQAS

Suppose you want to display AIRQUALITY ozone values for the New York City metropolitan area. To get started, you will need to have an extracted AIRQUALITY data set (described in Appendix A of this manual). After completing the log-on to the EPA's IBM computer system, you are ready to access the UAMQAS. Follow the instructions given in the *Getting Started* section (section 3.3), and type "UAMQAS" after the TSO READY prompt. Your terminal screen at this point will look similar to Figure 4-1.

```
92/05/19: NCC CUSTOMER SUPPORT HOURS EXTENDED          - SEE NEWS ALERT3
92/05/18: A LIST OF RECENTLY RELEASED EPA MEMOS        - SEE NEWS ALERT6
92/05/14: COBOL CONVERSION AID 1.6 AVAILABLE           - SEE NEWS ALERT9
92/05/14: ACCESS TO THE AIRS GRAPHICS SYSTEM           - SEE NEWS ALERT10
92/05/13: MEMORIAL DAY HOLIDAY SCHEDULE                - SEE NEWS ALERT2
92/05/11: MVS/ESA V4.2 OPERATING SYSTEM INSTALLED      - SEE NEWS ALERT1
92/05/11: PRIORITY BATCH JOB PROCESSING ON THE IBM     - SEE NEWS ALERT8
92/04/20: SUPERCALC 5.0 AVAILABLE FOR TESTING          _ SEE NEWS ALERT5
***

READY
UAMQAS
```

Figure 4-1. *Invoking the UAMQAS from the TSO.*

4.2 *UAMQAS MAIN MENU*

Press <Enter> to submit the command and activate the UAMQAS. Shortly after you press <Enter>, the *UAMQAS Main Menu* appears. As you can see in Figure 4-2, the *UAMQAS Main Menu* has five possible options from which you may choose. These are: the Extract module, the Graphics module, the Graphics Catalog module, Help, and Exit. These options are discussed in detail in section 5 (Menu Reference).

You may move your cursor from one option to another using the <Tab> key. To choose an option, move the cursor to the desired option and press <Enter>. For this tutorial, move the cursor to the Graphics module option and press <Enter>.

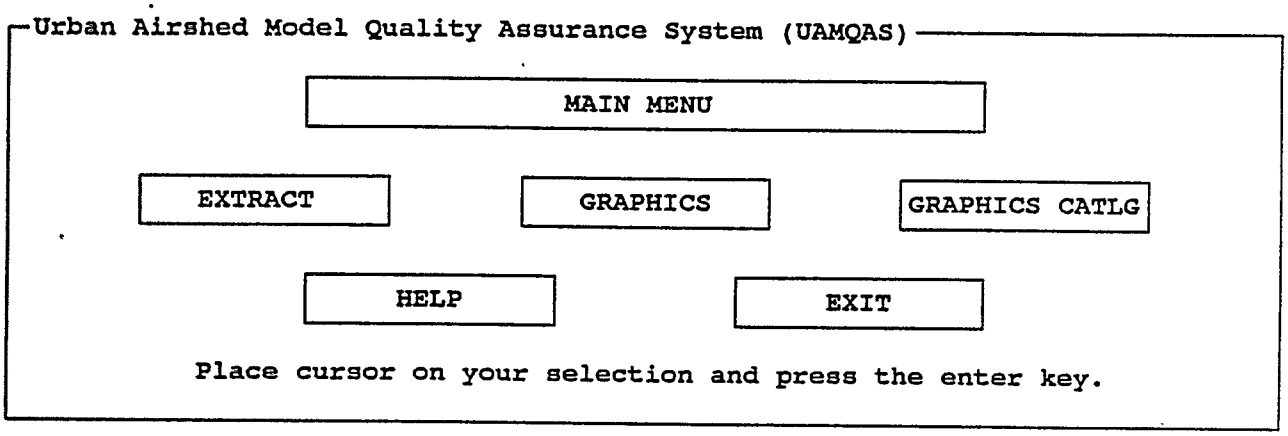


Figure 4-2. *UAMQAS Main Menu.*

4.3 SELECTING A GRAPHIC

Selecting the Graphics module option from the *UAMQAS Main Menu* will bring up the *Graphic Selection Menu* illustrated in Figure 4-3. This menu has one list and two selection fields. The list displays the different graphics available. The selection fields allow you to tell the system: (1) which type of graphic you wish to produce, and (2) the type of terminal or hard-copy device that you are using.

The cursor will appear in the first selection field, which is labeled **Graphic Selection.** Enter the number that appears beside the graphic you wish to produce. For illustrative purposes, "2" (spatial graphics) has been entered.

After entering the number in the first selection field, the cursor will automatically move to the **Device** field. In the example shown in Figure 4-3, "IBM3179" has been entered in the **Device** field. You must enter the appropriate device name for the equipment you are using. The UAMQAS currently supports more than a dozen different devices (terminals, emulators, etc.). You may view the list of supported devices by typing a "?" in the **Device** field and pressing <Enter>. If you are not sure which name is appropriate for the equipment you are using, consult the user's manual supplied by the terminal manufacturer or contact the EPA User Support Department for help (see section 1).

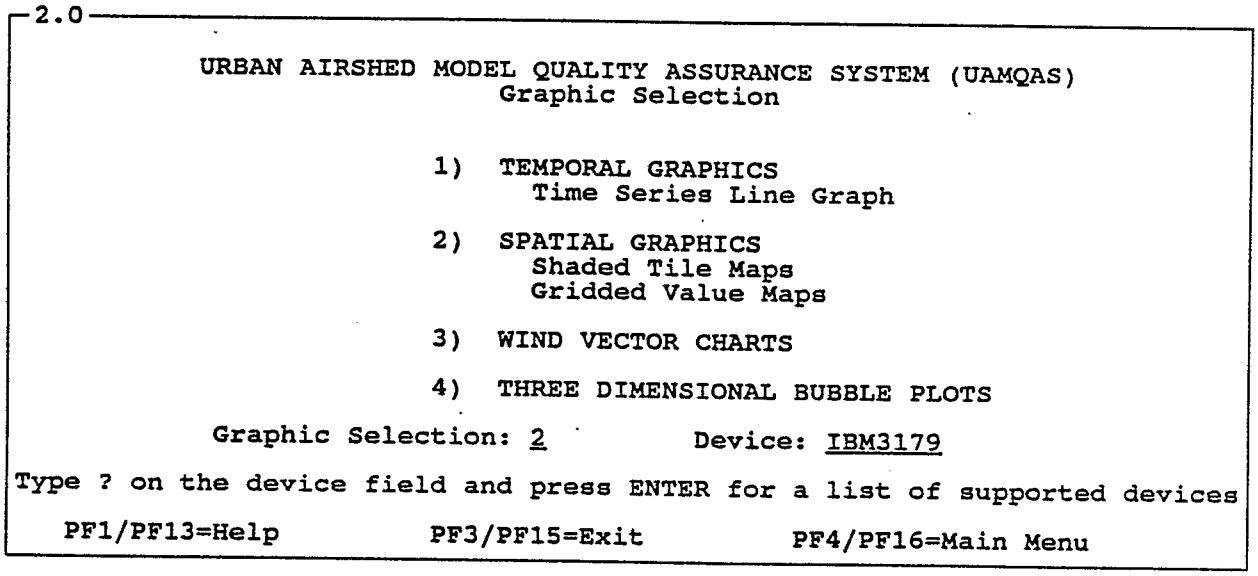


Figure 4-3. *Graphic Selection Menu.*

After filling in both fields in the *Graphic Selection Menu*, press <Enter>. You should then see the UAMQAS menu illustrated in Figure 4-4. However, if the UAMQAS detects a problem with either of the two fields in the *Graphic Selection Menu*, the menu will remain on your screen and an error message window containing a one-line description of the error will appear in the middle of the screen. On color monitors, this error window will be highlighted with a red, flashing border. On all monitors, there will be a note in the window border indicating that you first need to press <Enter> to continue.

After pressing <Enter>, the error window will disappear and the field containing the error will be highlighted. Only numbers 1 through 4 are valid in the **Graphic Selection** field. Other values will result in an error message. Specifying a device in the **Device** field that is not supported will also result in an error message. Note that the entry in the **Device** field must exactly match one of the devices in the list of supported devices.

If an error message appears, the cursor will be positioned in the field in which the error occurs. Simply type over the existing entry to make the correction and press <Enter>. If there is more than one error, another error window will appear describing the nature of the error. Repeat the above sequence, i.e., press <Enter> key, type over the error to make the correction, and press <Enter>.

After you press <Enter> on the *Graphic Selection Menu* and the system does not detect any errors, the system will move on to the next menu.

4.4 GENERATING A TILE MAP

4.4.1 Selecting Spatial Graphics Options

Selecting "2" (spatial graphics) from the *UAMQAS Graphic Selection Menu* will bring up the menu shown in Figure 4-4. The *Spatial Graphic Selection Menu* contains five lists and five corresponding selection fields.

```
2.3
                    UAMQAS:  Spatial Graphic Selection

          Map Type: 1  1) Shaded Tile    2) Gridded Value
       Pattern Type: 1  1) Color         2) Monochrome
  Grid Annotation: 1  1) None           2) Col/Row        3) Lat/Lon
  City Annotation: 3  1) None  2) All   3) Subset Cities  4) Prev Subset

         Analysis: 4  1) Average Values
                      2) Maximum Values
                      3) Hour of Maximum Value
                      4) Value at a Given Hour

  PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

Figure 4-4. *Spatial Graphic Selection Menu.*

The first list describes the two map types, the second describes the two color options, the third describes the type of grid annotation, the fourth whether cities will be marked on the map, and the fifth is the type of analysis to be performed on the data. For the purposes of this tutorial, simply select the first graphic type, the first pattern type, no grid annotation, selection 3 for city annotation and the fourth analysis option. These selections are illustrated in Figure 4-4 by the numbers 1, 1, 1, 3 and 4 respectively.

The first map type, "Shaded Tile" and first pattern type, "Color" will produce a map with each grid cell color filled and color keyed by values. The first grid annotation, "None" will not annotate any values along the left vertical border or the bottom horizontal border of the map. The third city annotation, "Subset Cities" will bring up an additional screen to allow the user to select specific cities to be annotated over the grid values. The fourth analysis value will display the value for each grid cell for the hour selected.

4.4.2 Data File Selection

The menu shown in Figure 4-4 works the same way as the UAMQAS *Graphic Selection Menu*. After you have made your selections by entering the appropriate number in each field, press <Enter>. The selections illustrated will bring up the *Data File Selection Menu* shown in Figure 4-5 below.

At this point you may tell the UAMQAS exactly what data to analyze and graph. The *Data File Selection Menu* contains five selection fields that must be completed before moving on to the next menu. There is one long field for entering a data set name. This long field is followed by four shorter fields for entering the start and end dates and start and end hours.

The long field calls for the name of a data set created by the Extract module included in this system. Enter the fully qualified data set name of the extracted data set in the space provided. Do not enclose the data set name in quotation marks.

```
                    UAMQAS: Data File Selection

Please enter the Fully Qualified Data Set Name for the Extracted
UAM input data set to be used in this graphic as well as the
period of interest (which must be within the range of the file).

Do not enclose the Data Set Name in quotes.

Extracted Data Set:  uidacct.UAM.SASD.PREP.NY.O3.L1.21JUL80.ARQ

Period of Interest:  Start Date 21JUL80  Hour 1
                     End Date   21JUL80  Hour 1
                              (DDMMMYY)    (1-24)


PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

Figure 4-5. *Data File Selection Menu.*

The four short selection fields define the period of interest and consist of the starting and ending date and starting and ending hours. The period of interest must be a time frame contained in the data set. The **dates** should contain seven characters of the form *ddmmmyy* where *dd* is the day, *mmm* is the month, and *yy* is the year. For example, if the extracted data set contains data for hours 1 to 24 on August 1, 1991, then you must enter "01AUG91" in the **Start Date** and **End Date** field. You may choose any range of hours between 1 and 24 for the **Start** and **End Hour** fields. The only restriction is that the starting hour must be earlier than the ending hour.

4.4.3 Print File Selection

For each graph produced by the UAMQAS, there will be a corresponding text file produced that records the exact values or data points plotted in each graph. The text file will duplicate the titles and label of the graph it accompanies. The *Print File Selection* window, shown in Figure 4-6, allows you to tell the system where to put this text file. The *Print File Selection* window will appear on top of the *Data File Selection Menu.* Refer to section 5 (Menu Reference) for details of the operation of the *Print File Section* window. For the purposes of this tutorial, enter a three-level file name beginning with your user ID/account number. If the file named already exists, the file will be overwritten by the current session. If the file does not exist, the UAMQAS will allocate the file for you. In the example shown in Figure 4-6, the name "uidacct.PRINT.LISTING" has been entered.

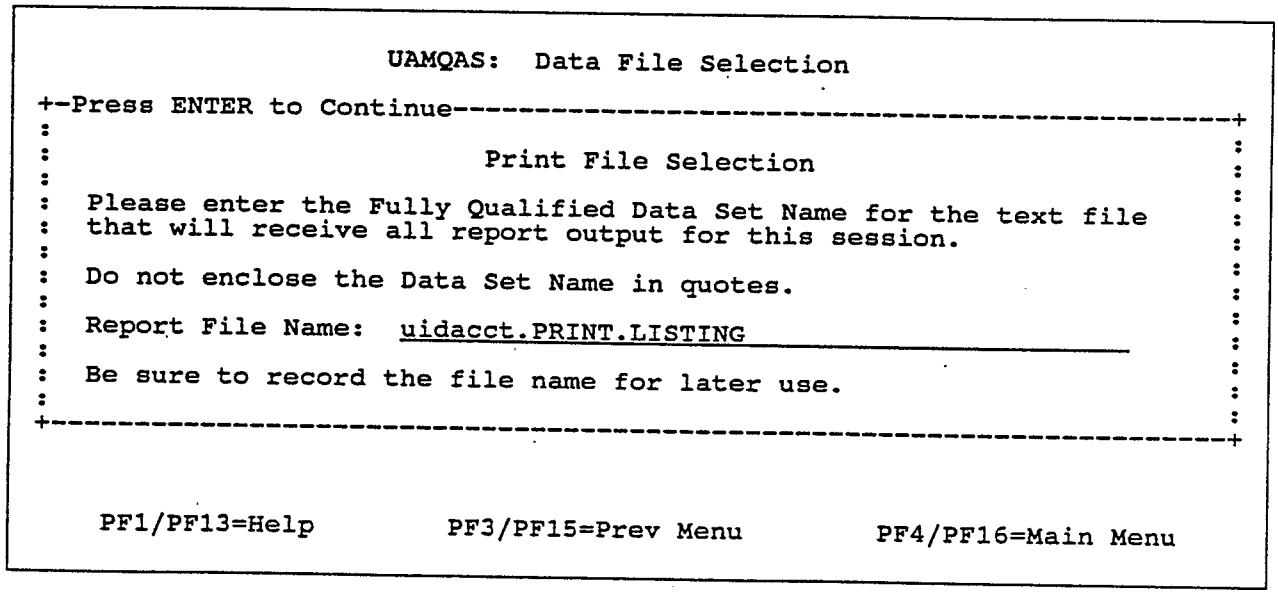


Figure 4-6. *Data File Selection Menu with Print File Selection window.*

4.4.5 Selecting Cities

The next menu is the *Cities Located Within Domain Menu* shown in Figure 4-7. If selection 3 "Subset Cities" was chosen on the *Spatial Graphic Selection Menu*, this screen will be displayed to allow the user to select the cities to be annotated on the finished map. The user simply enters an "S" in the **Selection** column for all cities which are to be annotated. If the list is longer than one screen, the user may scroll down the list by pressing PF8/PF20 and back up the list by pressing PF7/PF19. Once all selections have been made, pressing PF3/PF15 will save the selections and advance the user to the next menu.

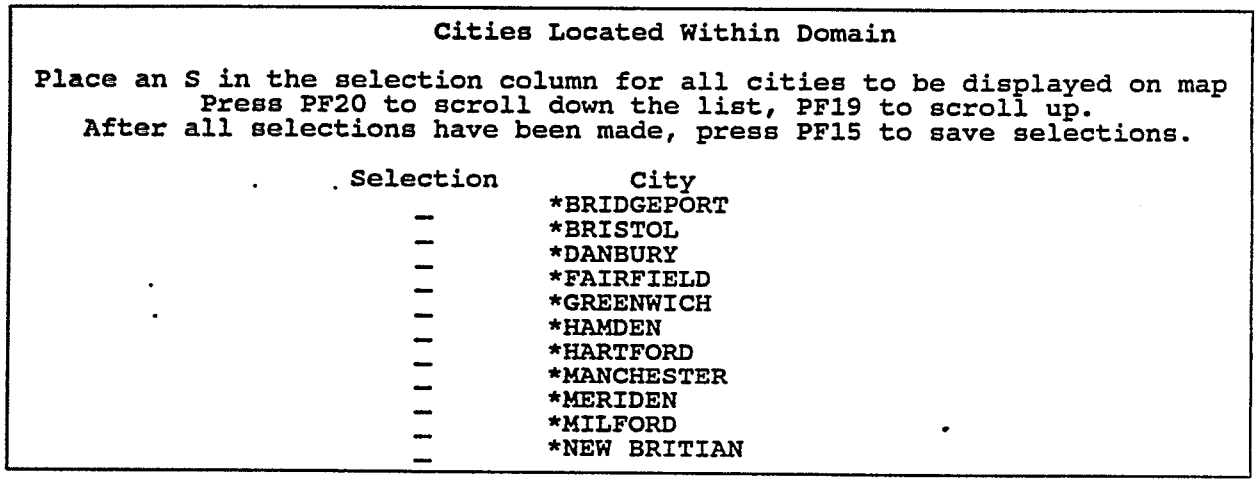


Figure 4-7. *Cities Located Within Domain Menu.*

4.4.6 Selecting Cutoff Values

The *Spatial Plot Pattern Selection Menu* allows you to select the patterns or colors of the grid cells on the tile map as well as the ranges of values assigned to the specified patterns or colors. The column labeled **Suggested Cutoff Value** has been supplied to give you a quick approximation of the values contained in the file. The five values represent the 10th, 30th, 50th, 70th and 90th percentiles (the sixth value is also the 90th percentile). You may choose these values or enter other values of your choice. If you choose to enter your own values rather than the suggested values, you can look at a more complete breakdown of the data. Before you enter any data, you can press PF8/PF20 to see the *Statistical Composition of Data* menu. This menu shows you the data values at specific percentiles, the maximum and minimum, and the number of total records. After looking at the composition of the data, press PF7/PF19 to return to the *Spatial Graphics Pattern Selection* menu. Remember, once you have typed in any values in any field, you can not look at the distribution of the data. Basic color values (or pattern values for monochrome plots) for your device are displayed in the protected fields at the bottom of the screen. You may enter any of these values in the **Assign Color/Pattern** fields or select from a color list by typing a question mark (?) in the color field shown in Figure 4-8 below and pressing <Enter>. Certain devices are capable of displaying more colors than the basic color list. You may view the list that is available for a particular field by typing a question mark (?) in the field of interest and then pressing <Enter>. A window with a complete color list for your specified device will appear. Figure 4-9 illustrates this window as it may appear in the menu.

The cursor will be on the first item in the list. To make a selection from the list, use the <Tab> or cursor movement keys to move the cursor to the item of your choice and press <Enter>. The window will disappear and the item you have chosen will appear in the selection list. Any field may be changed at any time as long as the menu is displayed on your screen. You may also return to any selection list as many times as you wish by using the question mark (?), <Enter> sequence.

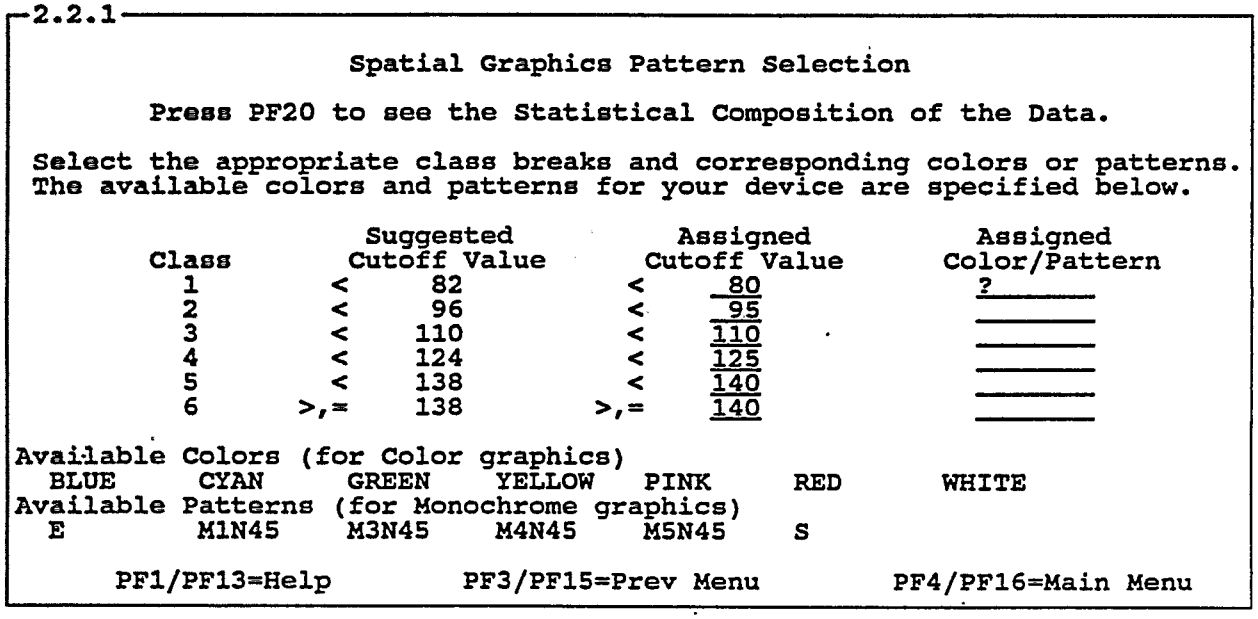


Figure 4-8. *Spatial Plot Pattern Selection Menu.*

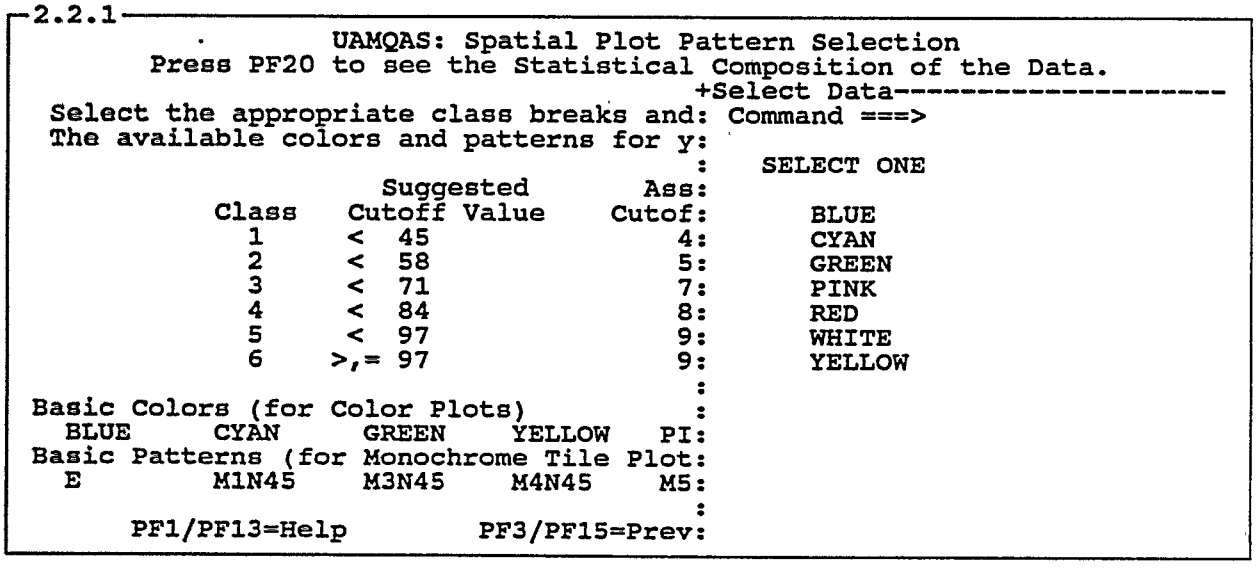


Figure 4-9. *Spatial Plot Pattern Selection Menu with a Select Data window.*

4.4.7 Selecting Titles and Descriptions

After making entries in the *Spatial Plot Pattern Selection Menu*, press <Enter> to bring up the *Graphic Title/Description Specification Menu* shown in Figure 4-10. This menu presents a table of the text information that will accompany the graphic. Unlike most UAMQAS fields, the fields for title text and axis label text will not be saved. This menu will appear with default titles and axis labels that accurately describe the graph based on information in the data sets you specified earlier in the *Data File Selection Menu* and previous menu fields. The UAMQAS automatically searches the specified data sets and inserts the species, study (defined by the user when running the Extract module), date, and hours of the data being analyzed. You may change the wording of these descriptions, but your descriptions are not saved and will not reappear in subsequent iterations of this menu.

You may also change the color, font, and size of the lines of text. Colors may be any that are supported by the device you are using. Fonts may be any of those listed in Chapter 6 of SAS/GRAPH Software, Version 6 (SAS Institute, Inc., 1990). Be aware that as the size of text increases, the size of the graph decreases; and as the size of text decreases, the text becomes less legible. Also be aware that if the text size is too large and the graph does not have enough room to be displayed, a blank screen will appear. The size of the text will need to be reduced before attempting to redisplay the graphics. Until you have run the UAMQAS once or twice, we recommend that you use a value of "3" in the title **Size** fields and a value of "2" in the axis label **Size** fields. Similar to most other fields, the **Color**, **Font**, and **Size** fields will be saved and recalled in subsequent iterations.

Note that the **Color**, specified for **Title #1** will also be used to color the boxes that surround the graph and the legend. The **Color** specified for **Title #2** will also be used to color the text that appears in the legend.

As on the *Spatial Plot Pattern Selection Menu*, lists are available for the **Color**, **Font**, and Size fields by typing a question mark (?) in the field and pressing the <Enter> key.

```
                UAMQAS: Graphic Title/Description Specification

Enter Requested information. Skip any fields not desired. Do not use quote

                TEXT                                          COLOR      FONT      SIZE
Title #1
03 CONCENTRATION FOR LEVEL 1 FOR NEW YORK                     WHITE      SIMPLEX   3.00

Title #2
AT HOUR 1  ON 21JUL80                                         WHITE      SIMPLEX   3.00

Vertical Axis
                                                              WHITE      SIMPLEX   2.00

Horizontal Axis
CONCENTRATION (PPB)                                           WHITE      SIMPLEX   2.00


    PF1/PF13=Help          PF3/PF15=Prev Menu          PF4/PF16=Main Menu
```

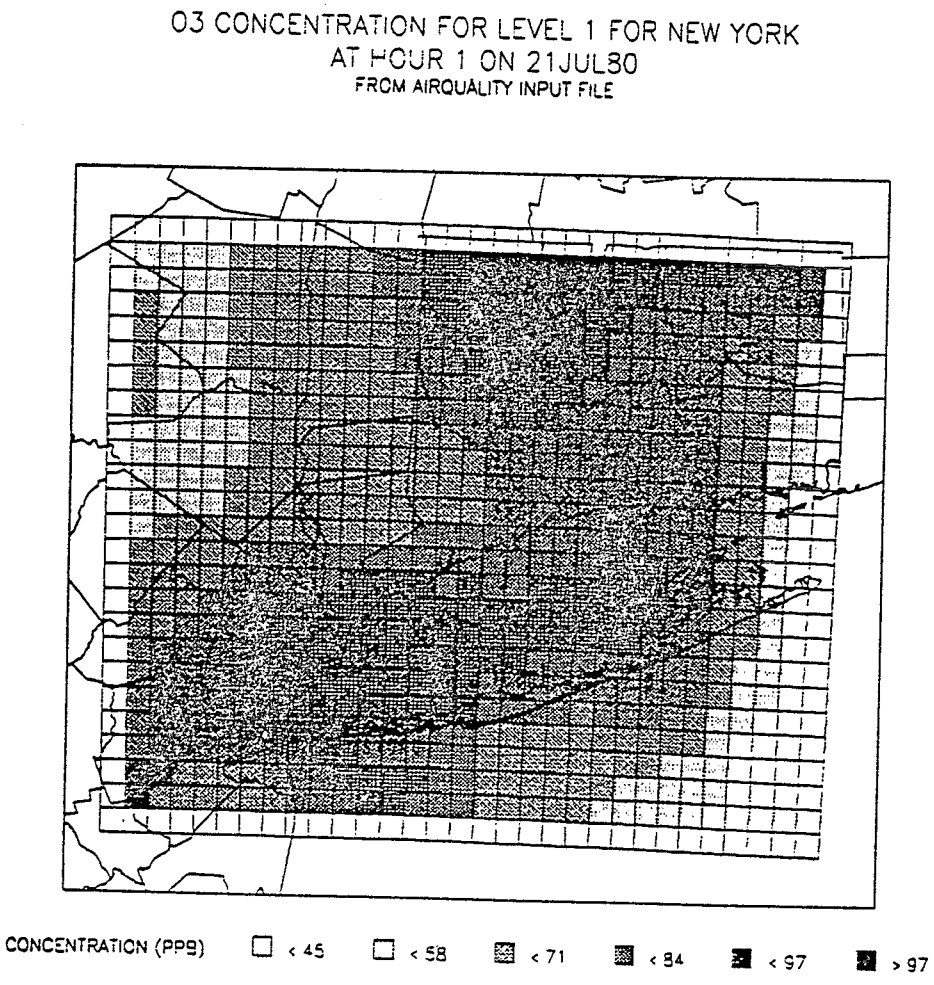
Figure 4-10. *Graphic Title/Description Specification Menu.*

4.4.8 Calculating Values and Plotting Graph Message

At this point, you have given the UAMQAS all the information necessary to produce the graph. When you press <Enter>, a one or two minute pause will occur while the UAMQAS generates the graph. During this period a screen will be displayed indicating that the computer is "Calculating Values and Plotting Graph". This screen clears when the graph begins to plot. Now, it is time to check the graph to see if it plots the information in which you are interested, and to check the text describing the graph to see if the default description is adequate. A table of the data points used to generate the graphic has been placed in your user-specified output print file. You may exit the system (UAMQAS) and view or print the table using standard IBM utilities or TSO commands.

If you have faithfully and successfully followed this tutorial, you should see a graph similar to the one in Figure 4-11 below. The graph displays a gridded tile map of the New York domain that has the cities that you selected placed on the grid field.

Figure 4-11. *Spatial Graph of New York.*



4.4.9 Termination Options

After you have checked the graph to be sure it is what you had in mind, you must choose whether or not to save the graph to a graphics catalog. If the graph is just for your information or is not exactly what you had in mind, you may be satisfied with simply viewing the graph on your screen and not saving it. However, if the graph presents information you wish to share with others, you will probably want to save it to a graphics catalog. Graphs saved to a graphics catalog can then be displayed on a variety of devices other than the one used to generate the original graph. Reproducing the graph on a screen or hard-copy device will also take less time than generating the original graph.

Press <Enter> to move on to the next menu, the *Termination Selection Menu*, shown in Figure 4-12 below. This menu presents five options for the disposition of the graph you have just viewed. These options will:

(1) return you to the *Graphic Selection Menu*,
(2) return you to the *Data File Selection Menu*,
(3) return you to the *Spatial Plot Pattern Selection Menu*
(4) return you to the *Graphic Title/Description Menu*,
(5) redisplay the same graphic
(6) bring up the *Graphics Catalog Generation Menu*, or
(7) end your current session with the Graphics module option and return to the *UAMQAS Main Menu*.

For any option, type the corresponding option number in the **Selection** field and press <Enter>. For the purposes of this tutorial, assume that we want to save the graphic. Type "6" in the **Selection** field and press <Enter>.

```
2.5
                    UAMQAS: Termination Selection

                Choose the action you would like to take.

        1)  Change Device or Plot Type
        2)  Change Input Data Sets or Starting/Ending Conditions
        3)  Change Cutoff Ranges
        4)  Change Titles or Axis Labels

        5)  Redisplay the Graphic
        6)  Save the Graphic

        7)  Exit UAMQAS Graphic Module (Without Saving Graphic)

 Selection: 6
```

Figure 4-12. *Termination Selection Menu.*

4.5 SAVING THE GRAPHIC IN A GRAPHICS CATALOG

The *Graphics Catalog Generation Menu* shown in Figure 4-13 contains brief instructions for providing a name for the catalog as well as a name and brief description of the graph that you have just produced. A single catalog may contain any number of graphics, so you may only need a single catalog for all the graphics you produce. On the other hand, you may wish to have more than one catalog for organizational purposes.

The **Graphics Catalog DSN** should be any valid file name for the computer system that you are using. On the EPA's IBM system you may wish to use a three-level name beginning with your user ID/account number (uidacct). Each level must be separated by a period (.) and should be no more than eight characters in length. Any combination of alphabetical and numerical characters can be used, but you must start with an alphabetical character (e.g., "uidacct.GRAPHICS.CATALOG"). Refer to the Guide to NCC Services (EPA, 1990b) for further naming conventions.

The graphic **Name** should be no more than eight alphanumeric characters containing no blanks, for example, "EMSCTILE". The graphic **Description** may be up to 40 characters long and may contain blanks (e.g., "NEW YORK, 11JUL80, MAXCONC LV1 CO EMISS".

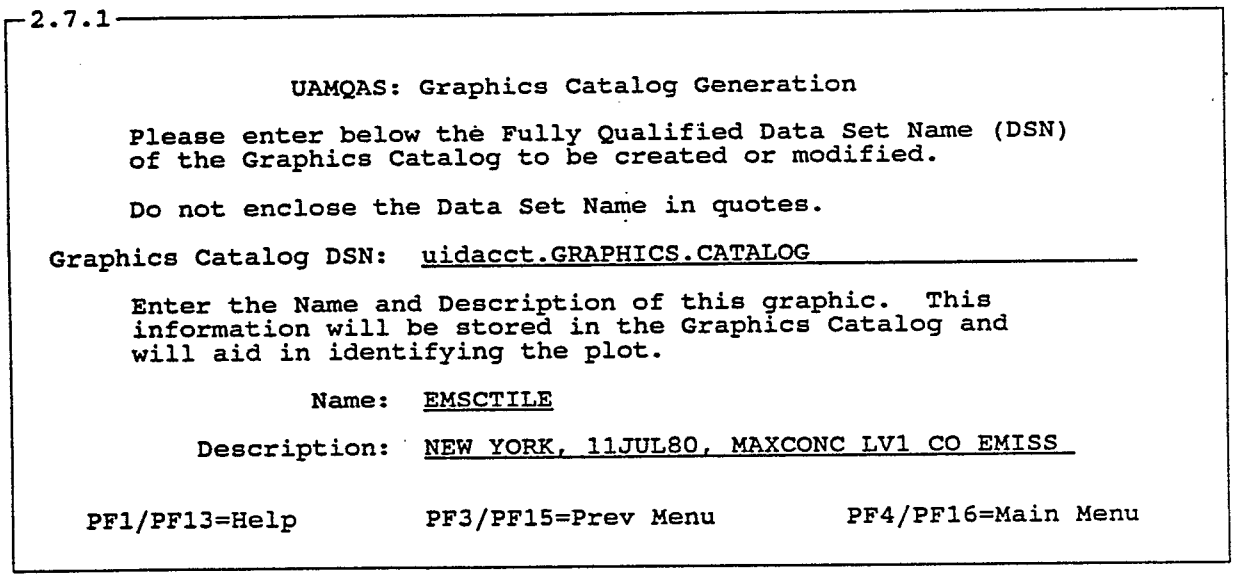


Figure 4-13. *Graphics Catalog Generation Menu.*

After you have provided names and a description in the appropriate fields, press <Enter>.

The PROC GREPLAY window shown in Figure 4-14 will appear to allow you to verify that the graphic has been placed in the graphics catalog. Press <PF3> or <PF15> to return to the *Termination Selection Menu*, shown in Figure 4-12.

Then, you have several choices: produce a different graphic by selecting options 1 or 2; reproduce the same graphic with new ranges or titles by selecting 3 or 4; take another look at the current graphic by selecting option 5; save another copy of the current graph (possibly to a second catalog) by selecting option 6 again; or end the session by selecting option 7.

At this point, you should have successfully produced a spatial graphic and saved it in a graphics catalog. Refer to Appendix B of this manual for more detailed instructions on using the Graphics Catalog module from the *UAMQAS Main Menu* to view or print graphics stored in a graphics catalog; this appendix is identical in content to section 4.3 of the user's manual for the UAMPPS (EPA, 1990a).

Section 5 (Menu Reference) provides a complete discussion of all UAMQAS menus. Section 6 (Files) presents a description of the tables that support the graphics.

```
PROC GREPLAY
Command ===>

IGOUT: GOUT.PLOTS          GOUT: _____________________    Device: IBM3179
TC:    _____________       Template: _________            Scroll: PAGE
CC:    _____________       Cmap: _________

Sel  Name       Type   Description                                  Created
___  EMSCTILE    I     NEW YORK, 11JUL80, MAXCONC L1 CO EMISS       10/29/92
```

Figure 4-14. *PROC GREPLAY window.*

5. MENU REFERENCE

This section describes the UAMQAS graphics menus. It begins with an outline of the menu structure, illustrating how menus are related to each other and the order in which they occur as you use the UAMQAS. The remainder of the section gives detailed descriptions of the menus. Each description explains a menu's purpose, tells how to use it, and lists error messages and tells what causes them.

5.1 MENU OUTLINE

The UAMQAS menus are numbered in the upper-left corner to give you an idea of where you are in the system. There are three menu groups that may be chosen from the *UAMQAS Main Menu*: Extract, Graphics, and Graphics Catalog. All menu numbers associated with Extract begin with a "1", all menus associated with Graphics begin with a "2", and all menus associated with the Graphics Catalog begin with a "3".

The following subsections provide information on Graphics menus (i.e., menus starting with "2"). As noted earlier in this manual, Appendices A and B present information on the Extract and Graphics Catalog menus, respectively. The Graphics Catalog appendix is identical in content to section 4.3 of the user's manual for the UAM Postprocessing System (UAMQAS) (EPA, 1990a) and is provided herein for easy reference.

The second digit in the menu number indicates the level of the menu. If there is more than one menu in a given level, the menus in that level are numbered consecutively with a third digit.

The UAMQAS graphics menus allow you to build a variety of graphs using data specified by you. The *Graphic Selection Menu* is the starting point for building any type of graph. After specifying the graphic you want from the *Graphic Selection Menu*, a menu unique to the type of graph specified, will come on screen (e.g., *Spatial Graphic Selection Menu*). This menu will allow you to further define the type of graph to be produced.

Next, the *Data File Selection Menu* and the *Print File Section* window, which are common to all the graphs, will be displayed. These screens let you tell the UAMQAS exactly what data you wish to analyze and where to place the table of data values. If you ask for a subset of cities, these screens will be followed by a *Cities Located Within Domain Menu* which is common to both the spatial graphics and wind vector charts. Otherwise, you will proceed directly to the *Attribute Selection Menu* unique to the type of graph selected.

The *Graphic Title/Description Specification Menu* follows the specific *Attribute Selection Menu*; this menu is common to all the graphs. It lets you specify the text that describes the graph. In the case of the spatial and wind graphics, when this menu is completed, the graph is completely defined and is displayed on your screen. For temporal graphics, and 3-dimensional bubble plots, the *Axis Scaling Menu* will be presented before the graph is displayed. The *Axis Scaling Menu* allows you to specify the upper and lower limits and the interval for the scaled axis. After any graph has been generated, a table of data values used to create the graph are placed in the print file.

After the graph is displayed and the table of data values is placed in the print file, the *Termination Selection Menu* presents several options for what to do next. If you choose to save the graphic, the *Graphics Catalog Generation Menu* will prompt you for the name of the catalog, and a name and description for the graph to be saved. After saving the graphic, the *Termination Selection Menu* will reappear. At this point, you may generate another graphic or end the session. After ending the session, you may use standard IBM or TSO commands to view or print the print file.

The remainder of this section describes each of the UAMQAS graphics menus in detail.

5.2 UAMQAS MAIN MENU

The *UAMQAS Main Menu* (Figure 5-1) presents five possible options: the Extract module, the Graphics module, the Graphics Catalog module, Help, and Exit. The Extract module is similar to the Extract module in the UAMPPS. Briefly, the Extract module allows users to extract data from the Urban Airshed Model input files sometimes subsetting to specific species and/or levels. The Graphics Catalog module is identical to the Graphics Catalog module in the UAMPPS. The Graphics Catalog module allow users to view or produce hard-copy output of graphs that have been saved in a graphics catalog. Please refer to Appendices A and B for details of the operation of these modules. The Graphics module is the focus of this section. The Help option provides general information about the system and the other options available in the *UAMQAS Main Menu*. The Exit option will end the current session and return you to the TSO READY prompt.

When you first start the system, your cursor will appear on the Extract option. Press the <Tab> key to move the cursor from one option to another. To select a particular option, move the cursor to the desired option and press <Enter>. To view and work with the menus discussed in this section, move the cursor to the Graphics option and press <Enter>.

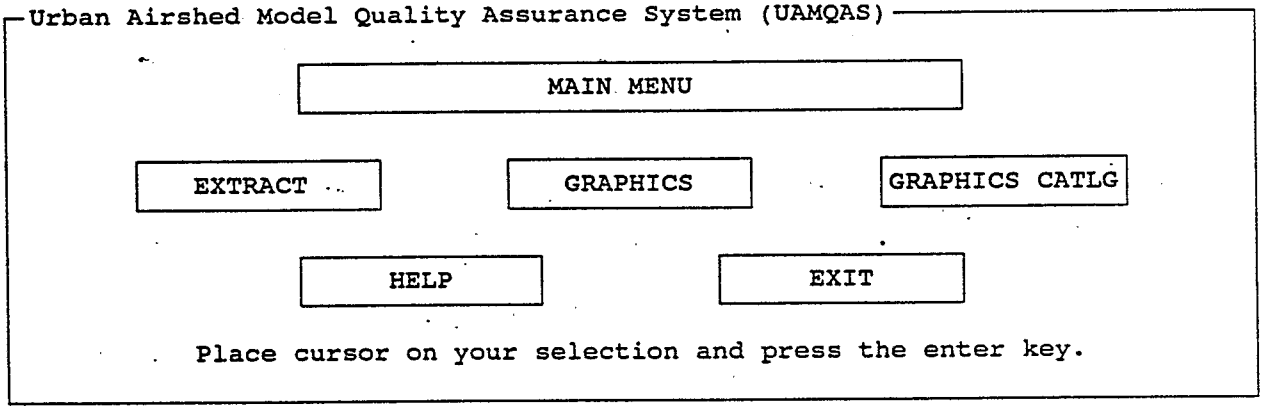


Figure 5-1. *UAMQAS Main Menu.*

5.3 GRAPHIC SELECTION MENU

The *Graphic Selection Menu* (2.0), shown in Figure 5-2, lets you select a graphic. In addition, the menu asks for the type of equipment you are using so that the system knows what language to "speak" when it sends the graph to your terminal.

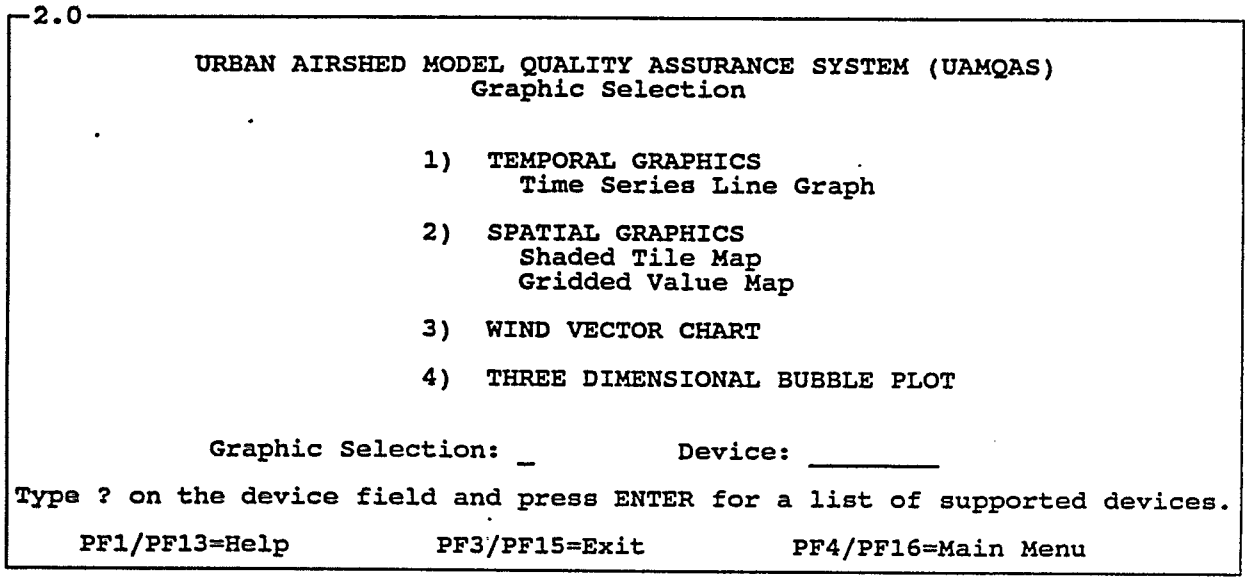


Figure 5-2. *Graphic Selection Menu.*

Instructions

Choose a graphic from the list and enter the number of that graphic in the **Graphic Selection** field.

Next, enter the name of the terminal you are using or emulating in the **Device** field. Be sure to consult the user's manual supplied by the terminal manufacturer if you are not certain what type of graphics device you are using or emulating. For further help, call the EPA User Support Department (see Section 1).

Note that the UAMQAS only checks the **Device** field for a supported device. There is no way for the UAMQAS to know if the device you have entered accurately describes the one you are using so there will *NOT* be an error message if the entry is incorrect. There will ONLY be an error message if the entry does not match one of the supported devices. *Failure to enter the proper device name on this screen may result in unrecoverable errors when you attempt to display a graph.*

If you are using a Tektronix 4207, 4211, or 4224 connected via a coaxial adapter, enter "TCX4207". If you are using one of the above named devices but NOT with a coaxial connection, enter "TEK4207". Enter "IBM3179" or "GDDMPCG" if you are using or emulating an IBM 3179G terminal; "IBM3279" should be entered if you are using or emulating an IBM 3279G terminal. Enter "TEK4010" if you are using a version of Kermit that supports graphics. After you have made valid entries in the **Graphic Selection** and **Device** fields, press <Enter> to move on to the next menu.

Error Messages

```
Please enter a 1, 2, 3, or 4.
```

Both fields in this menu are required. If you leave the **Graphic Selection** field them blank or enter any value other than "1" through "4", the above message will appear. Press <Enter> to remove the error window from your screen. The cursor will be placed on the **Graphic Selection** field to allow you to enter a number within the range of 1 through 4.

Finally, if you specify a value in the **Device** field that is not in the list of supported terminal devices or leave the field blank, a Device List Window will open and you may choose a device from the list.

5.4 METHOD/TYPE SELECTION MENUS

There are two method/type selections menus in the UAMQAS. One menu is common to both spatial graphics and 3-dimensional bubble plots. The other method/type selection menu is unique to the wind vector chart option. Analysis options for temporal graphics are determined after you enter one or two file names in the *Data File Selection Menu.*

5.4.1 Spatial Graphics Selection Menu

The *Spatial Graphic Selection Menu* (2.3), shown in Figure 5-3 below, lets you select the type of spatial graphic that you would like to create. You can display either color or monochrome versions of a shaded-tile or gridded-value map, using one of the four **Analysis** types. These **Analysis** options also apply to the three-dimensional bubble plots. The **Map Type, Pattern Type, Grid Annotation,** and **City Annotation** fields or options do apply to the three-dimensional bubble plot and these inputs will be ignored when creating a bubble plot.

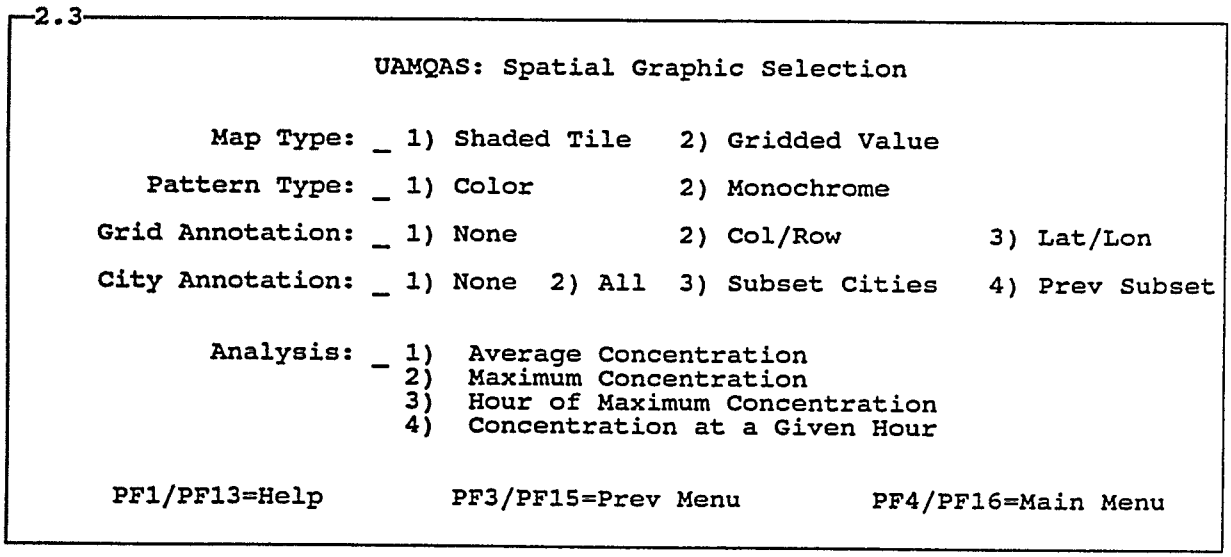


Figure 5-3. *Spatial Graphic Selection Menu.*

Instructions

Choose either a shaded-tile or gridded-value map by specifying "1" or "2" in the **Map Type** field. After selecting the type of graphic that you would like to display, you may then choose to display either a color or monochrome plot. Inserting "1" in the **Pattern Type** field will yield a color plot; a value of "2" will generate a monochrome plot.

Next, you must decide the type of grid annotation that you want displayed on the chart. Entering "1" in the **Grid Annotation** field will display no annotation. Entering "2" will annotate row and column numbers. Entering "3" will display latitude/longitude annotation.

The **City Annotation** field lets you determine what cities, if any, will be marked on the map. A value of "1" displays no cities. A value of "2" displays all major cities within the domain. However, you may find that displaying all cities within the domain produces a cluttered map. If you enter "3", you will be able to select the cities that you would like displayed from the complete list. After you have decided on a subset of cities to display, you may repeat that subset of cities on subsequent runs by entering "4". Note that you MUST enter "3" before entering "4". Also, the subset is not retained at the end of a session. Specifically, if you change domains within a session, you must enter "3" to produce a valid subset for the new domain. For example, entering "4" to obtain a previous subset for New York would not overlay on a domain for Atlanta.

The **Analysis** field (chosen next) that is applied to the grid cells will also be applied to any monitors that are displayed. If you choose to display several monitors and select "1" for the average concentration analysis, then the average concentration of each monitor over the selected range of hours will be displayed at that monitor's location. If you have selected a shaded tile map (**Map Type** "1"), then the monitor location will be shaded accordingly. If you have selected a gridded value map (**Map Type** "2"), then the monitor value (average, maximum, etc.) will be displayed at the monitor location.

By filling out the **Analysis** field, you determine the type of statistic that is displayed in the graphic. The types of statistics and their corresponding options are explained below.

Option 1--Average Concentration
Computes the average concentration for each cell in the domain and the average concentration for each monitor. This average is based on the number of hours specified in the *Data File Selection Menu*. The range of hours specified is considered to be the period of interest.

Option 2--Maximum Concentration
Computes the maximum concentration for each cell in the domain and the maximum concentration for each monitor over the specified time period and displays the result in the graphic.

Option 3--Hour of Maximum Concentration
Determines the hour at which the maximum predicted concentration for each grid cell and maximum observed concentration for each monitor in the domain occurs over the period of interest, and displays the result in the graphic.

Option 4--Concentration at a Given Hour
Determines the concentration at the hour specified in the **Start Hour** field of the *Data File Selection Menu* and displays the result in the graphic.

After you have specified all information, press <Enter> to process your selections.

Error Messages

```
Enter a number between <valid range> -or- press PF1/PF13 for help.
```

The above message appears if the number in any field is not in the allowable range for that field. Type over the incorrect value with a valid value.

```
Selection 4 only valid after selection 3 has been run.
```

The above message results from typing a "4" in the **City Annotation** field, when there is no previously selected subset of cities. Always choose option 3 before choosing option 4. During a session, you must create a subset before you use it.

5.4.2 Wind Vector Annotation Selection Menu

The *Wind Vector Annotation Selection Menu* (2.1.2), shown in Figure 5-4 below, lets you select pattern, grid, and city options similar to those in the *Spatial Graphic Selection Menu.* There are no analysis options. Wind Vector Charts only display wind speed and direction data for a given date and hour. The date and hour correspond to the **Starting Date** and **Starting Hour** fields entered in the *Data File Selection Menu.*

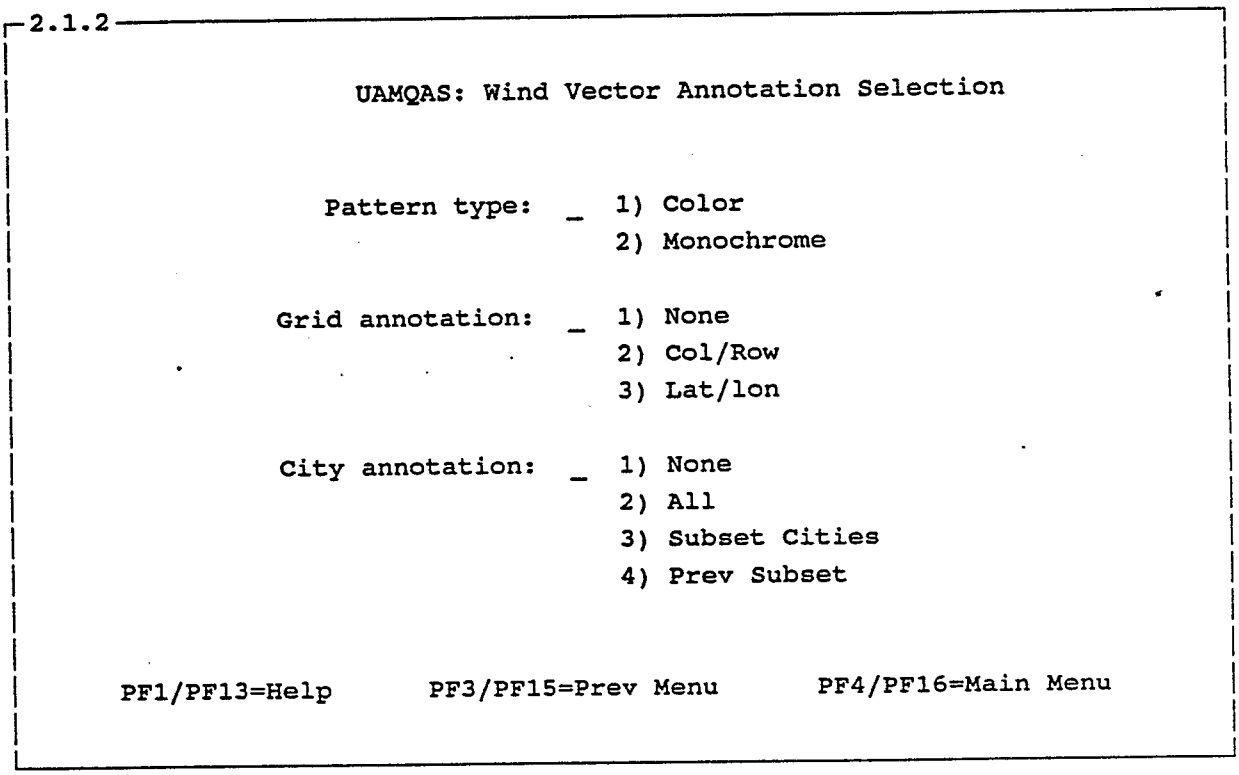


Figure 5-4. *Wind Vector Annotation Selection Menu.*

Instructions

Instructions for this menu are the same as those for the *Spatial Graphic Selection Menu.*

Error Messages

Error messages for this menu are the same as those for the *Spatial Graphic Selection Menu.*

5.5 DATA FILE SELECTION MENU AND PRINT FILE SELECTION WINDOW

The *Data File Selection Menu* lets you specify exactly which data set you want the UAM-QAS to graph. There are two versions of the *Data File Selection Menu.* One menu for spatial, 3-dimensional, and wind graphics, and one for temporal graphics. Section 5.5.1 discusses the menu for the spatial, 3-dimensional, and wind graphics. Section 5.5.2 discusses the menu for temporal graphics. The *Print File Selection* window allows you to direct the text output that accompanies each graph produced by the UAMQAS. The *Print File Selection* window will appear only once each time you run the UAMQAS, and will appear on top of the *Data File Selection Menu* the first time that menu appears in a session. The *Print File Selection* window is discussed in section 5.5.3.

5.5.1 Data File Selection Menu for Spatial, 3-Dimensional, and Wind Graphics

The *Data File Selection Menu*, shown in Figure 5-5, will appear for all graphics except temporal graphics. This menu contains five selection fields that must be completed before moving on to the next menu. There is one long field for entering a data set name. The long field is followed by four shorter fields for entering the start and end date, and start and end hours.

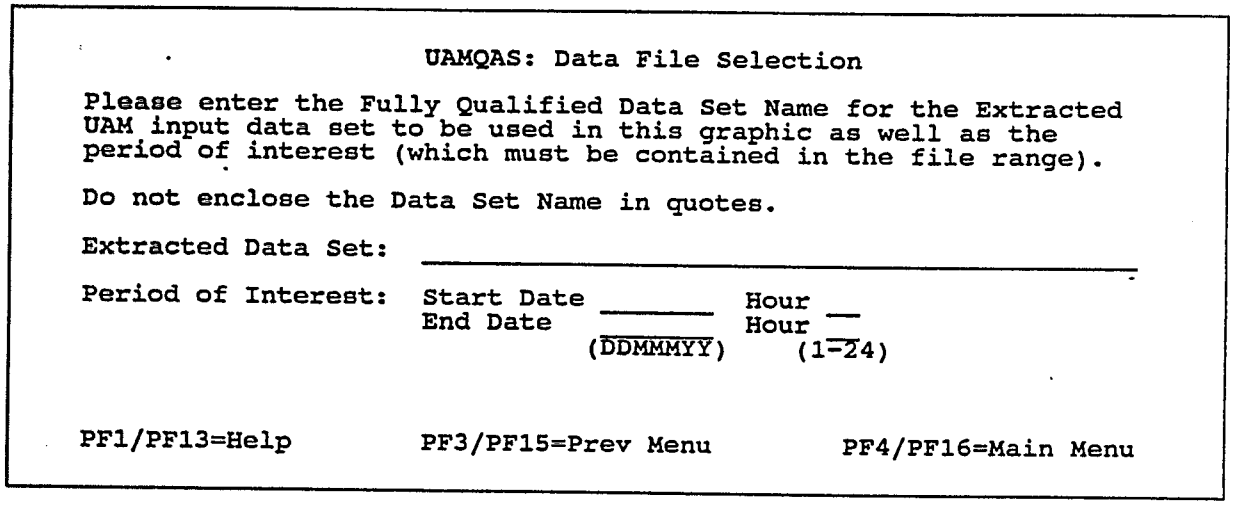


Figure 5-5. *Data File Selection Menu for All Graphics Except Temporal.*

Instructions

The long field calls for the name of an extracted data set created by the Extract module. Enter the fully qualified data set name of the extracted data set in the space provided. Do not enclose the data set name in quotation marks.

The four short selection fields define the period of interest and consist of the starting and ending date and starting and ending hours. The period of interest must be within the time frame contained in the data set. The **Date** should contain seven characters of the form *ddmmmyy* where *dd* is the day, *mmm* is the month, and *yy* is the year. For example, if the extracted and workfile data sets contain data for hours 1 to 24 on August 1, 1991, then you must enter "01AUG91" in the **Start Date** and **End Date** fields and may choose any range of hours between 1 and 24 for the **Start** and **End Hour** fields. The only restriction is that the starting hour must be earlier than the ending hour.

The date and hour fields must be completed. If you are plotting a temporal graph, these fields may be left blank. This is explained in the next section.

Error Messages

```
UAM file does not exist.  Please reenter data set name.
```

The UAMQAS will search for data set with the name that you have specified. If it is not found, the message above will appear. Press <Enter> to remove the Error Message window from the screen. The data set name will be highlighted. You should first check the entries you have made in this menu for accuracy. If you do not find any errors, end the current session and review the list of data sets. To end the current session, press <PF4/PF16> to return to the *UAMQAS Main Menu* and <Tab> to the EXIT option and press <Enter> to exit the system.

```
Reenter a dataset specific for spatial graphics.
```

This menu is displayed when creating a spatial, 3-dimensional, or wind graph. If the type of file specified is not one that is acceptable in these types of graphics, then the message above will appear. You should check and make sure that the file is AIRQUALITY, EMISSIONS, TEMPERATUR, TERRAIN, OR TOPCONC.

```
Time values must be between 1 and 24.  Please reenter.
```

This above message will appear if the time values are either less than 1 or greater than 24. Change the incorrect time values to be between 1 and 24.

```
Start day must preceed end day.  Please reenter.
```

The start day must preceed the end day. If it does not, the message above will appear. Make sure the days are in the right format, *ddmmmyy*, and the starting day is earlier than the ending day.

```
Start time must preceed end time.  Please reenter.
```

This message will appear if the ending time occurs earlier than the starting time. Change either the starting or ending time so that the analysis starts before it ends. The program will not run if you start the analysis at 12 and end it at 10.

```
DATE/TIME RANGE ENTERED:
Start Day:  02AUG91   Hour:  1     End Day:  02AUG91   Hour:  24
OUTSIDE RANGE OF FILE DATE/TIME:
Start Day:  01AUG91   Hour:  1     End Day:  01AUG91   Hour:  20

Please enter a new file name -or- enter a new date/time range.
```

This message will appear if the day or time values entered by the user do not correspond to the day or time values in the extracted data set. The day and/or time values must be changed to correspond to the data set being used in the graphic, or the data set name must be changed to one that contains the desired day and time values. The program will not continue until these values are the same.

5.5.2 Data File Selection Menu for Temporal Graphics

The *Data File Selection Menu* (2.1) for temporal graphics is shown in Figure 5-6. This menu is very similar to the previous menu shown in Figure 5-5. There are two fields to enter data set names and the same four fields for entering the start and end date, and the start and end hours.

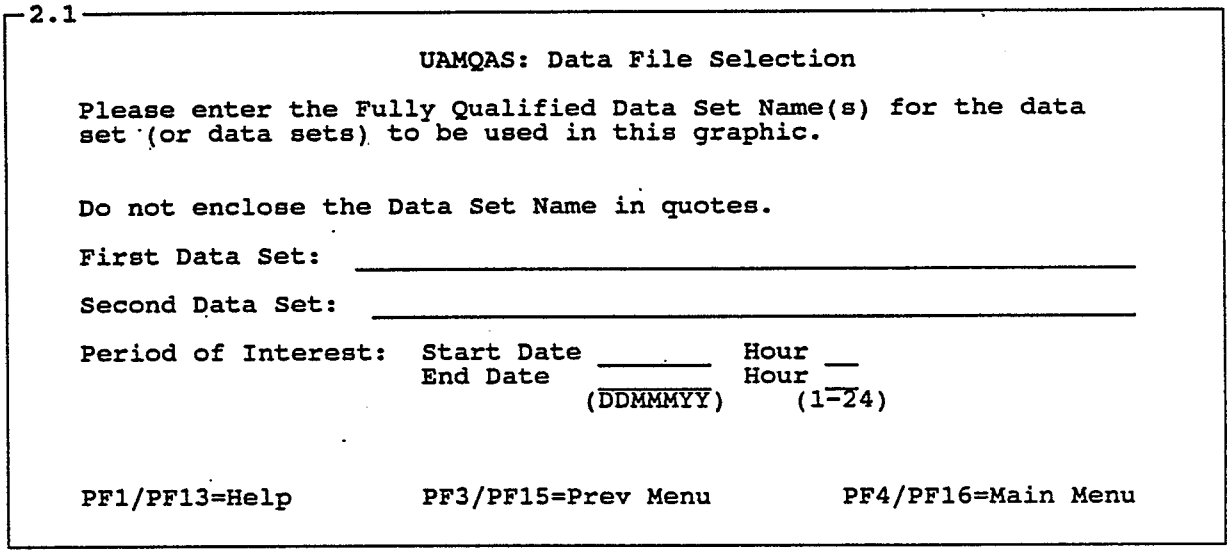


Figure 5-6. *Data File Selection Menu for Temporal Graphics.*

Instructions

The long fields call for the name(s) of the extracted data set(s) created by the Extract module. Enter a fully qualified data set name in the **First Data Set** field. The first data set can be any one of the three types of data sets available for temporal graphics. The **Second Data Set** field is an optional field. The user has the option, in temporal graphics, to plot DIFFBREAK and REGIONTOP data on the same graph and the **Second Data Set** field only needs to be filled in if the user chooses to create such a plot. If the user enters a METSCALARS file in the **First Data Set** field then the **Second Data Set** field should be left blank. UAMQAS ignores the second data set when the first data set entered is a METSCALARS. If the user enters a DIFFBREAK or REGIONTOP name in the **First Data Set** field then the **Second Data Set** field can either be left blank or can be filled in with the name of a REGIONTOP or DIFFBREAK data set, depending on which type was entered in the **First Data Set** field.

The period of interest fields are filled in the same manner as explained in section 5.5.1. The four short selection fields consist of the starting and ending date and starting and ending

hours. The period of interest must be within the time frame contained in the data set(s). The **Date** should contain seven characters of the form *ddmmmyy* where *dd* is the day, *mmm* is the month, and *yy* is the year. For example, if the extracted and workfile data sets contain data for hours 1 to 24 on August 1, 1991, then you must enter "01AUG91" in the **Start Date** and **End Date** fields and may choose any range of hours between 1 and 24 for the **Start** and **End Hour** fields. The only restriction is that the starting hour must be earlier than the ending hour.

The date and hour fields may be left blank for temporal graphics. If they are left blank, the system will plot for all the hours available in the extract data set(s).

Error Messages

```
UAM file does not exist.  Please reenter data set name.
```

The UAMQAS will search for data set(s) with the name(s) that you have specified. If they are not found, the message above will appear. Press <Enter> to remove the Error Message window from the screen. The data set name will be highlighted. This error may occur again for the second data set if it also can not be found. You should first check the entries you have made in this menu for accuracy. If you do not find any errors, end the current session and review the list of data sets. To end the current session, press <PF4/PF16> to return to the *UAMQAS Main Menu* and <Tab> to the EXIT option and press <Enter> to exit the system.

```
Temporal graphs not available for this file.
Please select another file or graphics option.
```

This menu is displayed when creating a temporal graphics. If the type of file specified is not METSCALARS, DIFFBREAK, or REGIONTOP, then the message above will appear. You should check and make sure that the file is one of these types.

```
Two DIFFBREAK files not allowed.
Please reenter a REGIONTOP file name or leave this field blank.
```

```
Two REGIONTOP files not allowed.
Please reenter a DIFFBREAK file name or leave this field blank.
```

If the user fills in both data set name fields with the two DIFFBREAK files or two REGION-TOP files, one of the two messages above will be displayed. The two data sets can not be the same type. Press <Enter> to remove this Error Message window and the **Second Data**

Set field will be highlighted. Either replace the name with the correct type of file or leave it blank an process the graphic with the one data set.

```
The second file has no time in common with the first file.

AVAILABLE DATA DATE/TIME RANGE ENTERED:
Start Day:  01AUG91   Hour:  1     End Day:  01AUG91   Hour:  20
REQUESTED DATE/TIME RANGE:
Start Day:  10AUG91   Hour:  1     End Day:  10AUG91   Hour:  24

Please select a different file or leave this field blank.
```

If the user does select to graph both a DIFFBREAK and a REGIONTOP file, but the dates and/or times don't agree between the two files, the above message will be displayed. One or both data set names need to be changed or the second one can be left blank to continuing processing

```
Time values must be between 1 and 24.  Please reenter.
```

This above message will appear if the time values are either less than 1 or greater than 24. Change the incorrect time values to be between 1 and 24.

```
Start day must preceed end day.  Please reenter.
```

The start day must preceed the end day. If it does not, the message above will appear. Make sure the days are in the right format, *ddmmmyy*, and the starting day is earlier than the ending day.

```
Start time must preceed end time.  Please reenter.
```

This message will appear if the ending time occurs earlier than the starting time. Change either the starting or ending time so that the analysis starts before it ends. The program will not run if you start the analysis at 12 and end it at 10.

```
Requested time range exceeds available time range.

AVAILABLE DATA DATE/TIME RANGE ENTERED:
Start Day:  01AUG91   Hour:  1     End Day:  01AUG91   Hour:  20
REQUESTED DATE/TIME RANGE:
Start Day:  02AUG91   Hour:  1     End Day:  02AUG91   Hour:  24

Please adjust requested time range or leave date/time fields blank.
```

This message will appear if the day or time values entered by the user do not correspond to the day or time values in the extracted data set. The day and/or time values must be changed to correspond to the data set being used in the graphic or the fields may be left blank and allow the program to use the available date/time from the data set. Another option is to change the data set name(s) must be changed to one that contains the desired day and time values.

5.5.3 Print File Selection Window

For each graph produced by the UAMQAS, there will be a corresponding text file produced that records the exact values or data points plotted in each graph (Figure 2-5, Section 2.5). The table of data points is generated every time the user produces a graph. The text file will duplicate the titles and label of the graph it accompanies for spatial and 3-dimensional graphics and will duplicate the titles of the graph it accompanies for temporal and wind graphics. The *Print File Selection* window, shown in Figure 5-7, allows you to tell the system what to name this text file. Choose any file name that is a valid name for your computer system. If your system requires file allocation, UAMQAS will allocate the file if it has not been previously allocated. The *Print File Selection* window will appear on top of the *Data File Selection Menu*. After each graph or group of graphs you generate, various options allow you to return to the *Data File Selection Menu* or to an earlier menu to generate multiple graphs or groups of graphs within the same session. Thus, it is possible to be presented with the *Data File Selection Menu* several times in a single session. The *Print File Selection* window will only appear the first time through the *Data File Selection Menu*. Text files will be appended to each other until you end the session by exiting the system.

After you run the UAMQAS the first time, the **Report File Name** field will be saved and recalled just like most of the other fields in the UAMQAS. If you use the same file name in a subsequent session, the file from the previous session will be over written. This is intended as a convenience to the user as a method of conserving computer resources. If you do not want the previous file to be over written, either rename the existing file before starting the UAMQAS, or specify a new name in the *Print File Selection* window.

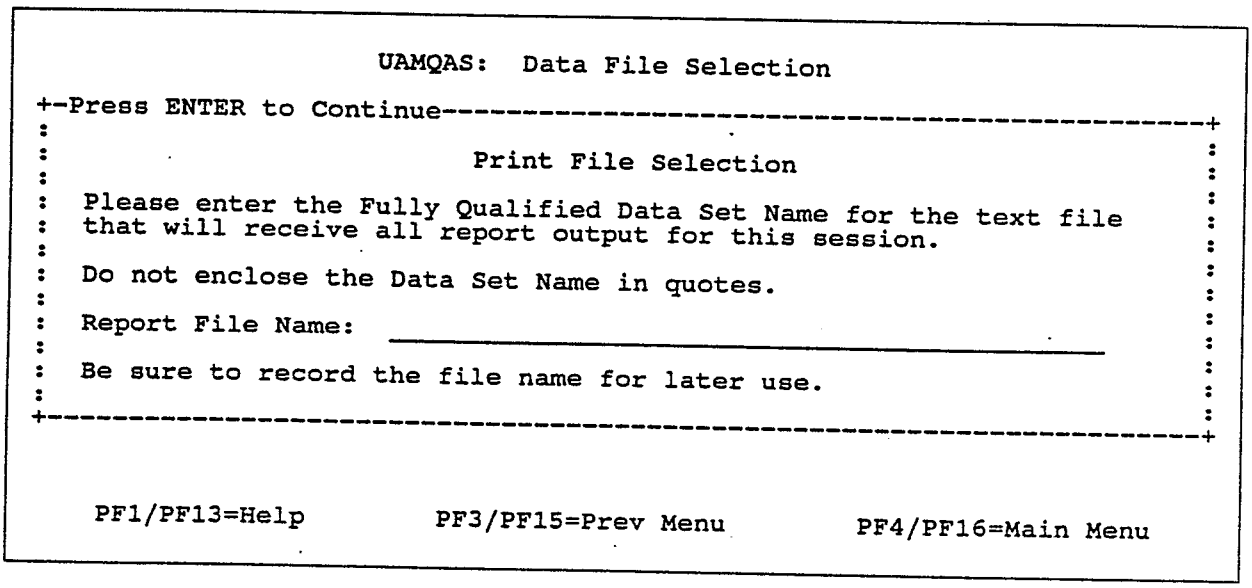


Figure 5-7. *Data File Selection Menu with Print File Selection window.*

5.6 SPATIAL GRAPHICS PATTERN SELECTION AND STATISTICAL COMPOSITION OF DATA

When the spatial graphics option is chosen on the *Graphic Selection Menu*, there are certain menus that are unique to spatial graphics. These menus follow the *Data File Selection Menu* (explained in section 5.5.1). The menus include the *Spatial Graphics Pattern Selection Menu* and the *Cities Located Within Domain Menu*. These menus are described in the remainder of this section.

5.6.1 Spatial Graphics Pattern Selection Menu

The *Spatial Graphics Pattern Selection Menu* (2.2.1) shown in Figure 5-8 lets you select cutoff values for the class breaks and a corresponding color or monochrome fill pattern to be displayed on the graphic. The *Statistical Composition of Data Menu* shown in Figure 5-9 is the second page of the *Spatial Graphics Pattern Selection Menu*, and is invoked by pressing <PF8/PF20> after the *Spatial Graphics Pattern Selection Menu* is displayed. The purpose of the *Statistical Composition of Data Menu* is to provide you with the information necessary to enter the cutoff values on the *Spatial Graphics Pattern Selection Menu*. Based on the graphic chosen on the *Graphic Selection Menu* (Figure 5-2), you will be presented with the values of the data to be plotted, broken down into several percentiles. Thus, you can determine the approximate percent of the data that will be contained in the cutoff ranges you select.

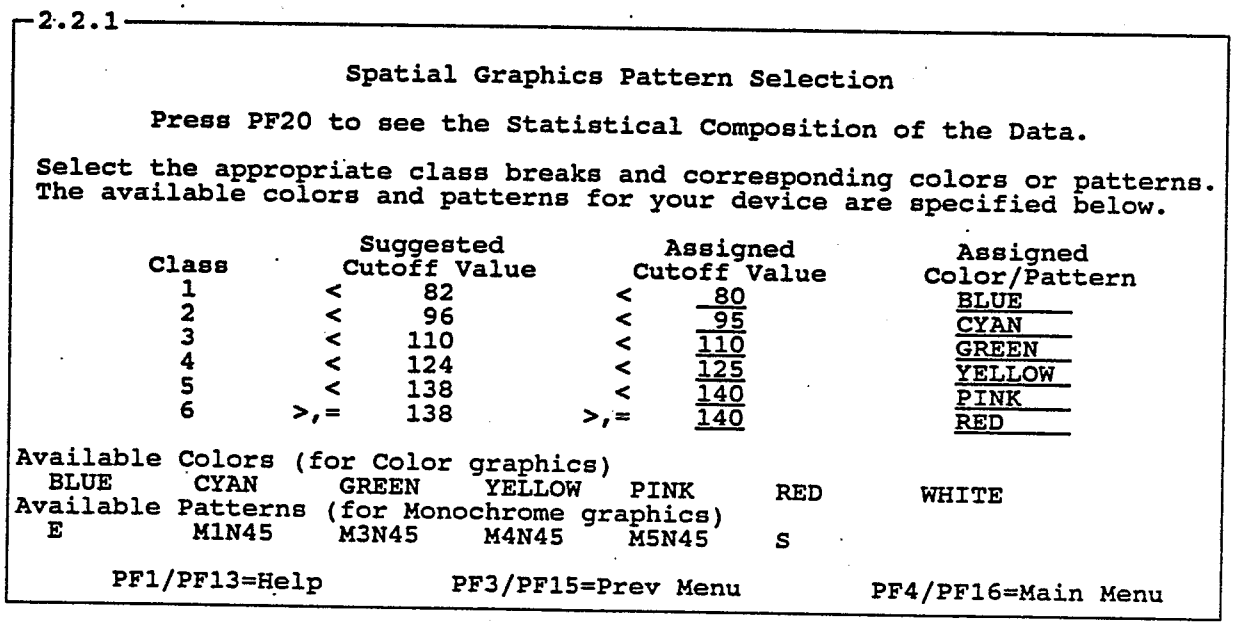


Figure 5-8. *Spatial Graphics Pattern Selection Menu.*

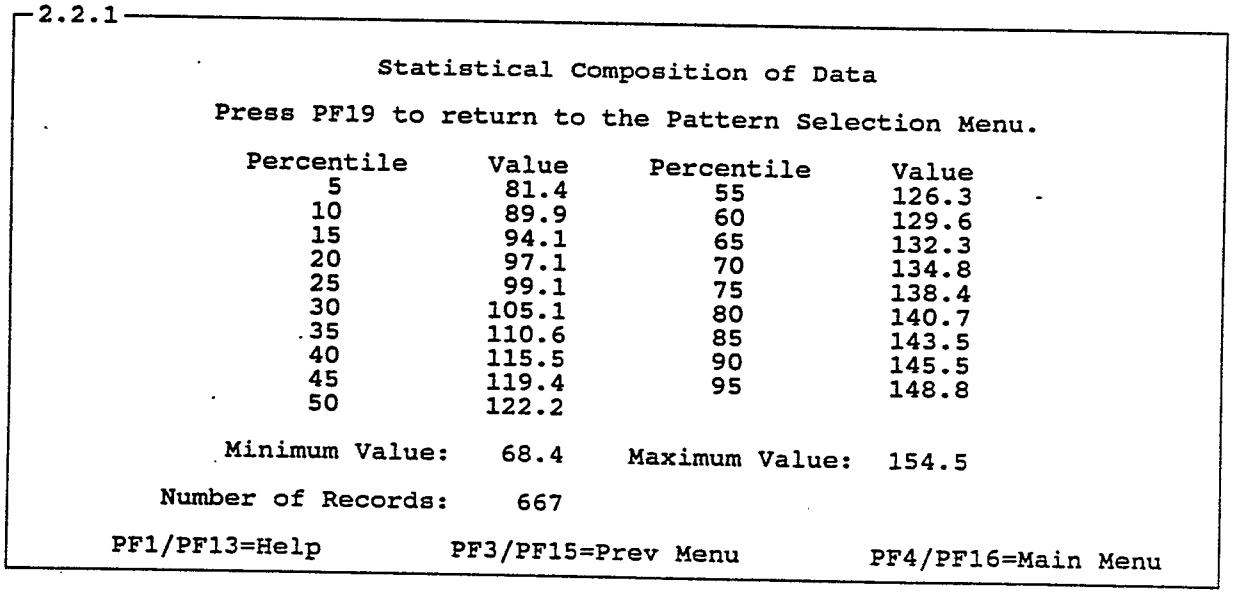


Figure 5-9. *Statistical Composition of Data Menu.*

Instructions

The **Suggested Cutoff Value** column offers a suggestion of six cutoff values derived from the data range detailed on the *Statistical Composition of Data Menu.* You may enter these values in the **Assigned Cutoff Value** field of the *Spatial Graphic Selection Menu* (Figure 5-8), or enter your own values. All six fields must have a value, and the values must be in ascending magnitude from top to bottom. Note that the logical operator preceding the **Assigned Cutoff Value** field will be used to subset the data for this class. For example, as shown in Figure 5-8, the following class breaks are defined:

- Class 1 -- Data values less than 80 will be colored blue.
- Class 2 -- Data values greater than or equal to 80 but less than 95 will be colored cyan.
- Class 3 -- Data values greater than or equal to 95 but less than 110 will be colored green.
- Class 4 -- Data values greater than or equal to 110 but less than 125 will be colored yellow.
- Class 5 -- Data values greater than or equal to 125 but less than 140 will be colored pink.
- Class 6 -- Data values greater than or equal to 140 will be colored red.

You must also enter a color or monochrome fill pattern in the corresponding **Assigned Color/ Pattern** field. We recommend that you choose from the colors/patterns listed at the bottom of this screen, because these colors are supported by the device you specified on the *Graphic Selection Menu.* Also, the available monochrome patterns (listed) have yielded good results, therefore they should be used if pattern fills are needed.

Note that the values for **Assigned Cutoff Value** and **Assigned Color/Pattern** fields are retained from the previous run. If you change species, levels, or analysis types, the **Assigned Cutoff Value** may not adequately represent the range of values present. Always refer to the **Suggested Cutoff Value** column or the *Statistical Composition of Data Menu* before selecting cutoff values.

Error Messages

```
Value required at cursor location.
```

If any **Cutoff Value** field or any **Color/Pattern** field is left blank, then the above message will appear. Enter a value at the appropriate location.

```
Cutoff value <3> must be greater than cutoff value <2>.
```

Each succeeding **Cutoff Value** field must be greater than the preceding one. If this condition is not met, a message similar to the one above appears. Change the appropriate fields to meet this condition.

5.6.2 Cities Within Domain

If **City Annotation** field selection "3" is chosen on the *Spatial Graphic Selection Menu* (Figure 5-3), then the *Cities Located Within Domain Menu* shown in Figure 5-10 will be displayed. It allows you to subset the cities within the domain covered by the extracted data set.

```
                    Cities Located Within Domain

Place an S in the selection column for all cities to be displayed on map.

          Press PF20 to scroll down the list, PF19 to scroll up.

   After all selections have been made, press PF15 to save selections.

                Selection        City

                        _       *BRIDGEPORT
                        _       *BRISTOL
                        _       *DANBURY
                        _       *FAIRFIELD
                        _       *GREENWICH
                        _       *HAMDEN
                        _       *HARTFORD
                        _       *MANCHESTER
                        _       *MERIDEN
                        _       *MILFORD
                        _       *NEW BRITAIN
```

Figure 5-10. *Cities Located Within Domain Menu.*

Instructions

All cities included in the SAS cities data set that fall within the current domain will be present in the list of cities. The list may be several screens long. To scroll down the list, press the <PF8/PF20> key; to scroll up, press the <PF7/PF19> key. Type an "S" in the **Selection** column next to each city that you want in the city subset. After you have completed the selection process, press <PF3/PF15> to save the subset and move on to the next menu.

Error Messages

There are no error messages for this menu.

5.7 TEMPORAL GRAPHICS MENUS

When the temporal graphics option is chosen on the *Graphic Selection Menu*, menus that are unique to temporal graphics follow the *Data File Selection Menu* (explained in Section 5.5.2). These are either a *Select Analysis Menu* or a *Select Parameter Menu* followed by a *Time Series Attribute Selection Menu.* These menus are described sections 5.7.1 through 5.7.3.

5.7.1 Select Analysis Menu

The *Select Analysis Menu* shown in Figure 5-11 is presented whenever the user enters the name of a DIFFBREAK or REGIONTOP extracted file name in the *Data File Selection Menu.* This menu allows the user to plot the domain average or the values for a single grid cell for each hour in the time range requested in the *Data File Selection Menu.*

```
Select Analysis
                For a plot of DIFFBREAK or REGIONTOP files choose:

          Analysis:   _  1)  Average Over Domain
                         2)  Select a Grid Cell

          Grid Cell:     __  Row Number      Select From:   2  To:  35
                         __  Column Number   Select From:   7  To:  40


      PF1/PF13=Help       PF3/PF15=Prev Menu       PF4/PF16=Main Menu
```

Figure 5-11. *Select Analysis Menu.*

If the domain is rectangular, the ranges of both the rows and the columns will be displayed. If the domain is not rectangular, only the range of rows will be displayed accompanied by the message "The domain is not a rectangle. Please choose a row and press <Enter> to see a range of columns for that row." When the user enters a row number within the available range, the system will then display the range of available columns for that row.

Instructions

To generate a plot of domain averages, enter a "1" in the **Analysis** field and press <Enter> to move on to the *Attribute Selection Menu.* To generate a plot of the hourly values of a single grid cell, enter a "2" in the **Analysis** field and a row number and column number in their respective fields. Select numbers that are within the available ranges. If the domain is not rectangular, enter a row number and press <Enter> to see a range of column numbers

for that row. Enter a column number that is within that range and press <Enter> to move on to the *Attribute Selection Menu.*

Error Messages

```
Enter a 1 or 2 in this field.
```

The error message will be displayed if any value other than 1 or 2 is entered in the **Analysis** field. The cursor will be placed on the **Analysis** field to allow the user to enter a 1 or 2.

```
Requested row number must be between <min> and <max>.
```

The error message will be displayed if the entry in the **Row Number** field is outside the available range of rows. The cursor will be placed on the **Row Number** field to allow the user to enter a number within the available range of rows.

```
Requested column number must be between <min> and <max>.
```

The error message will be displayed if the entry in the **Column Number** field is outside the available range of columns. The cursor will be placed on the **Column Number** field to allow the user to enter a number within the available range of columns.

5.7.2 Select Parameter Menu

The *Select Parameter Menu* shown in Figure 5-12 is presented whenever the user enters the name of a METSCALARS extracted file name as the first file name in the *Data File Selection Menu.* The *Select Parameter Menu* allows the user to select one of the five meteorological parameters contained in the METSCALARS file.

```
Select Parameter
        Choose one of the parameters listed below to be plotted.

              Parameter: _    1)  Temperature Gradient
                              2)  Exposure Class
                              3)  Radiation Factor
                              4)  Water Concentration
                              5)  Atmospheric Pressure


     PF1/PF13=Help       PF3/PF15=Prev Menu       PF4/PF16=Main Menu
```

Figure 5-12 *Select Parameter Menu*

Instructions

Enter a number from 1 through 5 corresponding to the parameter you wish to plot and press <Enter>.

Error Messages

```
Enter a number from 1 through 5 or press PF13 for help.
```

The error message will be displayed if any value other than 1 through 5 is entered in the **Parameter** field. The cursor will be placed on the **Parameter** field to allow the user to enter a number within the allowable range.

5.7.3 Time-Series Attribute Selection

The time-series graph displays symbols that represent the data points being plotted. Each group of symbols is connected by a line that helps show relationships between the two data sets. The *Time-Series Attribute Selection Menu* (2.2) shown in Figure 5-13 allows you to specify line type, line color, symbol type, and symbol size. The most common line types are solid, dashed, and dotted. Line color also determines symbol color and may be any color supported by the device you are using. The most common symbol types are squares, triangles, and stars.

```
2.2
                 UAMQAS: Time-Series Attribute Selection

                         Line    Line       Symbol   Symbol
                         Type    Color      Type     Size
   DIFFBREAK Values:     __      ________   _        ___

   REGIONTOP Values:     __      ________   _        ___
                   Enter "?" for a list of valid entries.



 PF1/PF13=Help        PF3/PF15=Prev Menu       PF4/PF16=Main Menu
```

Figure 5-13. *Time-Series Attribute Selection Menu.*

Instructions

Enter a question mark (?) in the **Line Type, Line Color,** or **Symbol Type** field to see a list of valid entries for each field. Within a selection list, <Tab> to the entry you wish to select and press <Enter>. Your selection will appear in the selection field. The size of the symbol may be adjusted to improve clarity or detail. Enter a number between 0 and 10 in the **Symbol Size** field. **Symbol Size** is a three-character field, because you may want to enter decimal values (e.g., ".75", "2.2").

Error Messages

```
Please enter a symbol size between 0 and 10.
```

The error message will be displayed if any value other than 0 through 10 is entered in the **Symbol Size** field. The cursor will be placed on the **Symbol Size** field to allow you to enter a number within the range of 0 through 10.

There are no error messages for the **Line Type, Line Color,** or **Symbol Type** fields. If the entry is not valid, the system will select a default entry and plot the graph accordingly. Note that system defaults may give unexpected results.

5.8 GRAPHIC TITLE/DESCRIPTION SPECIFICATION MENU

The *Graphic Title/Description Specification Menu*, shown in Figure 5-14, presents a table of the text information that will accompany the graphic. This menu will appear with default titles and axis labels that accurately describe the graph based on information in the data sets you specified earlier in the *Data File Selection Menu* and in previous menu entries.

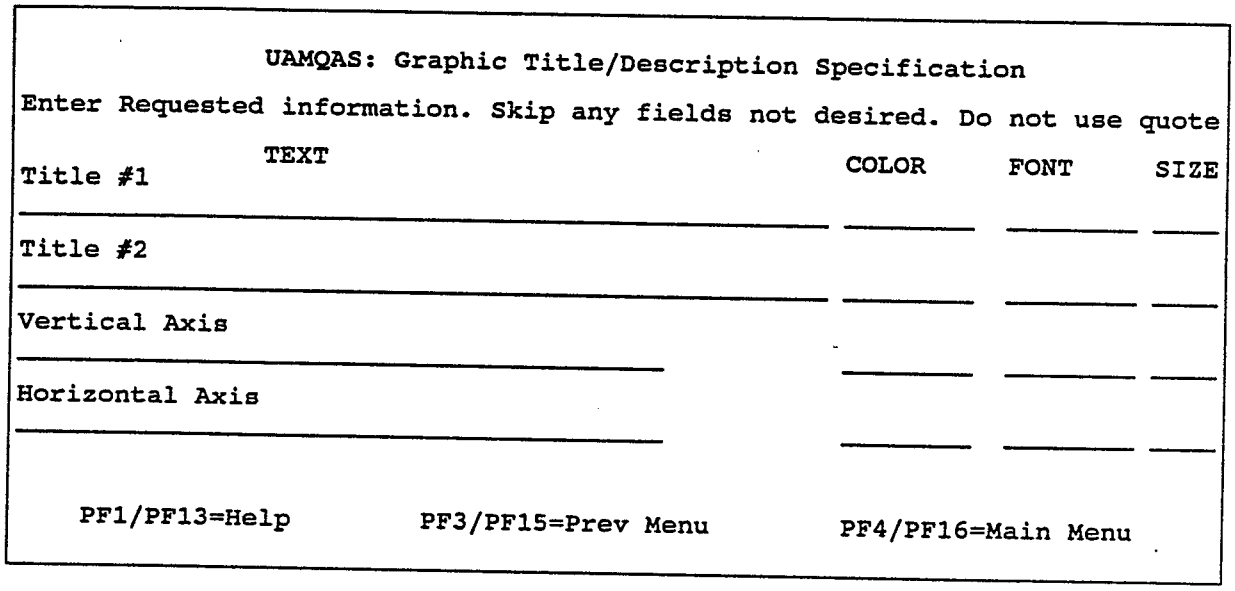


Figure 5-14. *Graphic Title/Description Specification Menu.*

Instructions

The UAMQAS automatically searches the specified data sets and inserts the species, study (defined by the user when running the Extract module), date, and hours of the data being analyzed. You may change the wording of these descriptions, but the changes will not be saved. Each time you run the system, default values for the **Text** fields will be derived from the data sets specified in the *Data File Selection Menu*. This feature allows you to verify the files specified in that menu.

The values that you enter in the **Color**, **Font**, and **Size** fields will be saved and recalled just like most other fields in the UAMQAS. Colors may be any that are supported by the device you are using. Fonts may include any listed in Chapter 6 of SAS/GRAPH Software, Version 6 (SAS Institute, Inc., 1990). Enter a question mark (?) in the **Color** and **Font** fields to see a list of valid entries for each field. Within a selection list, <Tab> to the entry that you wish to select and press <Enter>. Your selection will appear in the selection field. Enter a number for the size of the text in the **Size** field. **Size** is a four-character field, because you may want to enter decimal values (e.g., "1.75", "2.25").

Be aware that as the size of text increases, the size of the graph decreases; and as the size of text decreases, the text becomes less legible. Until you have run the UAMQAS once or twice, we recommend that you use a **Size** value of "3" for the **Title** fields and "2" for the **Axis** label fields. Note that the **Color, Font,** and **Size** specified for the **Horizontal Axis** label control the color, font, and size of the bar labels in the bar chart graphic. In addition, for all of the graphic categories except the spatial graphics category, the **Color** specified for **Title #1** will also be used to color the box that surrounds the graph and the box that surrounds the legend, as well as the reference lines and other annotations that appear in the graph. The **Color** specified for **Title #2** will be used to color the text that appears in the legend.

By allowing the user to completely control the color of the entire display, the user may eliminate the need for color mapping when sending graphs to a printer. Color mapping is a process for changing all occurrences of a color (in a single graph) to another color. This process is a standard feature of the GREPLAY procedure in SAS and is fully described in Chapter 36 of SAS/GRAPH Software, Version 6 (SAS Institute, Inc., 1990). The use of color mapping is frequently necessary in a graph that displays the color "white" on the monitor screen. White shows up quite clearly on the black background of the monitor screen, but white is invisible on the white background of hard-copy printouts. Color mapping allows the user to issue an instruction (e.g., to map white to black) when sending a graph to a printer to make graphic elements visible that would otherwise be invisible. Note that the color mapping process is usually not necessary if none of the graphic elements are white, and the user can simplify the printing process by specifying colors other than white.

The graphics category, spatial graphics, is a special case. This category requires a minimum of eight colors (including the background color) to generate a color graph. However, some color terminals can only display a maximum of eight colors. Thus, the use of the color white may be unavoidable. For this reason, certain elements in the spatial graphics (e.g., grid lines, map lines, and monitor location outlines) are specified as white by the system, and the color mapping process is unavoidable.

Error Messages

```
A value is required at the cursor location.
```

The above message will be displayed if the **Text, Color,** or **Font** fields for **Title #1** are left blank. It will also be displayed if any the **Color** or **Font** field is left blank and there is text for **Title #2, Vertical Axis,** or **Horizontal Axis.**

There are no error messages for the **Text, Color,** or **Font** fields unless it is required by the type of graph selected. If an entry in the **Color** or **Font** fields is not valid, the system will select a default entry and plot the graph accordingly. Note that system defaults may give unexpected results.

5.9 AXIS SCALING MENU

The *Axis Scaling Menu* (2.6) allows users to select the maximum and minimum scale values for the scaled axes. For example, if all the graphed values are in the range of 500 to 600, the user may want to specify a minimum scale value of 400 in order to take a closer look at the details of the graph. Also, if users are creating several graphs to be compared to each other, this menu allows them to ensure the use of the same scale. The *Axis Scaling Menu* is appropriate for only two graphics types: time series and bubble plot (illustrated in Figure 5-15 and Figure 5-16). (For spatial graphics and wind vector charts, the system will proceed directly from the *Title/Description Menu* to the graphics display.)

5.9.1 Time Series Axis Scaling Menu

For time series graphics, the values chosen in the *Time Series Axis Scaling Menu* (Figure 5-15) will apply to the vertical axis. The user gets to choose the scaling of the graphic by filling in the three necessary fields.

2.3

UAMQAS: Time Series Axis Scaling Menu

	Data Values	Selected Axis Values
Maximum	250	300
Minimum	110	100
Interval		10

PF1/PF13=Help PF3/PF15=Prev Menu PF4/PF16=Main Menu

Figure 5-15. *Time Series Axis Scaling Menu.*

Instructions

The system checks the data about to be plotted and reports the maximum and minimum values in the **Data Values** column of the *Time Series Axis Scaling Menu.* The **Selected Axis Values** column provides selection fields for the user to specify maximum and minimum axis values (which should always encompass the full range of the data values) and the interval to be indicated along the length of the scale line.

In Figure 5-15, a **Maximum Selected Axis Value** of "300", a **Minimum Selected Axis Value** of "100", and an **Interval** value of "10" have been entered. These values will result in about 20 labeled tick marks along the scale line.

The fields in the **Selected Axis Values** column will be blank for the first run of the system. In subsequent runs, these fields will contain the values from the previous run. Users should always check the new **Data Values** against the previous **Selected Axis Values** to be sure that the **Selected Axis Values** encompass the full range of data values. If the **Data Values** fall above or below the range of **Selected Axis Values**, an error message will be displayed (see discussion below) and no graph will be produced until the **Selected Axis Values** fall with the acutal data range..

At this point, you have given the UAMQAS all the information necessary to produce a graph. After you press <Enter>, there will be a pause of one or two minutes while the UAMQAS generates the graph you have requested. The graph will be generated and displayed on your screen. After the graph has been displayed, you may press <Enter> to continue to the next menu.

Error Messages

```
Data Values greater than Maximum Axis Value. . .Reenter.
```

The above message will be displayed if the **Maximum Data Value** is larger than the **Maximum Selected Axis Value.** The cursor will be placed at the **Maximum Selected Axis Value** field to allow you to enter a number that is larger than the **Maximum Data Value.**

```
Data Values less than Minimum Axis Value. . .Reenter.
```

The above message will be displayed if the **Minimum Data Value** is smaller than the **Minimum Selected Axis Value.** The cursor will be placed at the **Minimum Selected Axis Value** field to allow you to enter a number that is smaller than the **Minimum Data Value.**

```
Range not evenly divisible by step value. . .Reenter.
```

The above message will be displayed if the difference between the **Maximum** and **Minimum Selected Axis Values** is not evenly divisible by the value entered for the **Interval.** The cursor will be placed at the **Interval** field to allow you to enter a number that will evenly divide the difference between the **Maximum** and **Minimum Selected Axis Values.**

```
Step value creates too many intervals...Reenter.
```

The above message will be displayed if the number of intervals or tick marks created by the **Interval** field is too large and the graph can not be displayed. The cursor will be placed at the **Interval** field to allow you to enter a number that will create fewer tick marks.

5.9.2 Bubble (3-Dimensional) Plot Axis Scaling Menu

For bubble plots (Figure 5-16), the values chosen on the *Three Dimensional Plot Options Menu* will apply to the z axis. Since the Bubble Plot is a 3-dimensional plot, there are a few more options like rotation, tilt, and needles.

2.6

UAMQAS: Three Dimensional Plot Options

		Selected Axis Values
Maximum Data Value:	199	200
Minimum Data Value:	66.26	0
Interval		10
Suggested Rotation (degrees)	340	210
Suggested Tilt (degrees)	70	60
Needles (Y/N)?	Y	Y

PF1/PF13=Help PF3/PF15=Prev Menu PF4/PF16=Main Menu

Figure 5-16. *Bubble Plot Axis Scaling Menu.*

Instructions

As in the time series graphic, the system checks the data about to be plotted and reports the maximum and minimum values in the **Data Values** column and checks the **Selected Axis Values** for the maximum, minimum, and interval to ensure that they are within range.

Three-dimensional bubble plots have options for rotation, tilt, and needles. The rotation option turns the plot about a vertical axis. A rotation of 0 degrees produces a view of the data looking from south to north. A rotation of 90 degrees produces a view of the data looking from west to east. A rotation of 180 degrees produces a view of the data looking from north to south. a rotation of 270 degrees produces a view of the data looking from east to west. The suggested rotation of 340 degrees produces a view of the data looking from approximately south-southeast to north-northwest. Enter a number between 0 and 360.

The tilt option turns the plot toward or away from you. A tilt of 0 degrees produces an overhead view similar to the maps generated by the spatial graphics category. A tilt of 90 degrees produces a horizontal view that obscures map-like features. Enter a number between 0 and 90.

The needles option offers a choice of whether to include vertical lines that connect the bubbles to the x-y plane. Enter a Y to display the needles, or an N not to display the needles. Users will need to experiment with these options for each data set to determine the view that best highlights pertinent features, and for presentation purposes, will probably want to produce a series of views.

Again, at this point, you have given the UAMQAS all the information necessary to produce a graph. After you press <Enter>, there will be a pause of one or two minutes while the UAMQAS generates the graph you have requested. The graph will be generated and displayed on your screen. After the graph has been displayed, you may press <Enter> to continue to the next menu.

Error Messages

Error messages for this menu are the same as those for the *Time Series Axis Scaling Menu.* There are no error messages for the rotation, tilt, and needles options, however, entering values outside of the ranges specified in the instructions above may yield unexpected results.

5.10 TERMINATION SELECTION MENU

The *Termination Selection Menu* (2.5), shown in Figure 5-17, presents five possible options for a variety of actions you may want to take after generating a graphic. The first five options allow you to restart the system at various points to make changes and/or display the graphic again. The sixth option allows you to save the graphic in a graphics catalog and brings up a menu for specifying the options associated with catalog entries. The last option allows you to exit the system.

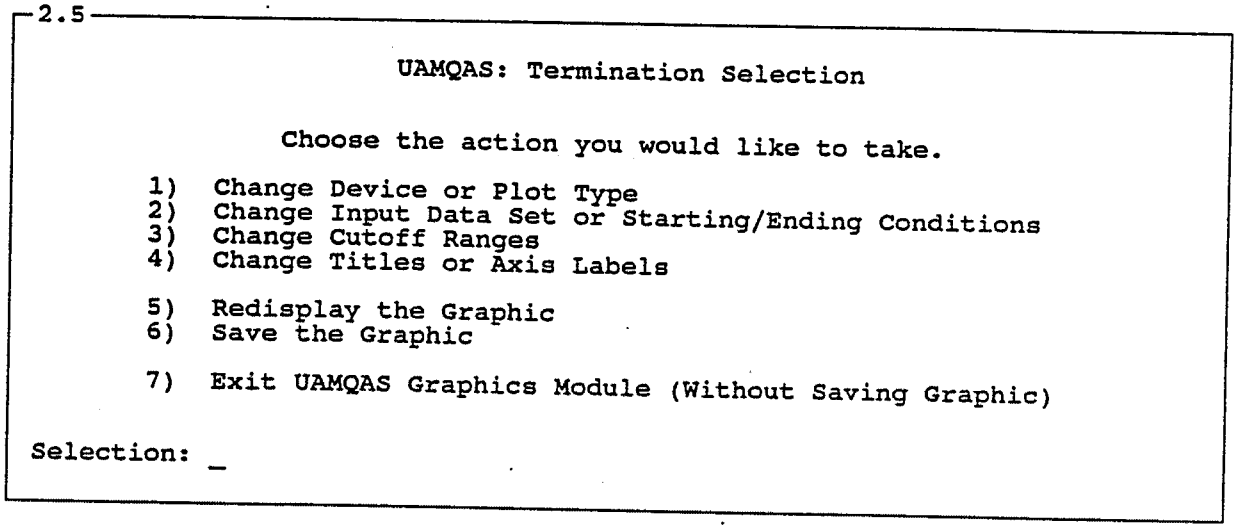


Figure 5-17. *Termination Selection Menu.*

Instructions

Type the number of the option you want in the **Selection** field and press <Enter>. Enter "1" to return to the *Graphic Selection Menu,* where you may change any of the options and generate a completely different graph. Enter "2" to return to the *Data File Selection Menu* and generate a similar graph using different data. Enter "3" to return to the *Spatial Plot Pattern Selection Menu* (or the *Axis Scaling Menu* for Temporal Graphics). Enter "4" to return to the Graphic Title/Description Selection Menu, where you may change the titles and their attributes. Enter "5" to simply re-display the graphic. Enter "6" to bring up the *Graphics Catalog Generation Menu*, which will allow you to save the graphic that you just generated in a graphics catalog. Enter "7" to end your current session with the Graphics module and return to the *UAMQAS Main Menu.*

Error Messages

You must enter a value from 1-7 inclusive to continue.

The above message will be displayed if any value other than "1" through "7" is entered in the **Selection** field. The cursor will be placed on the **Selection** field to allow you to enter a number within the range of 1 through 7.

5.11 GRAPHICS CATALOG GENERATION MENU

The *Graphics Catalog Generation Menu* (2.7.1), shown in Figure 5-18, allows you to permanently save any or all graphics that you generate in a device-independent SAS graphics catalog.

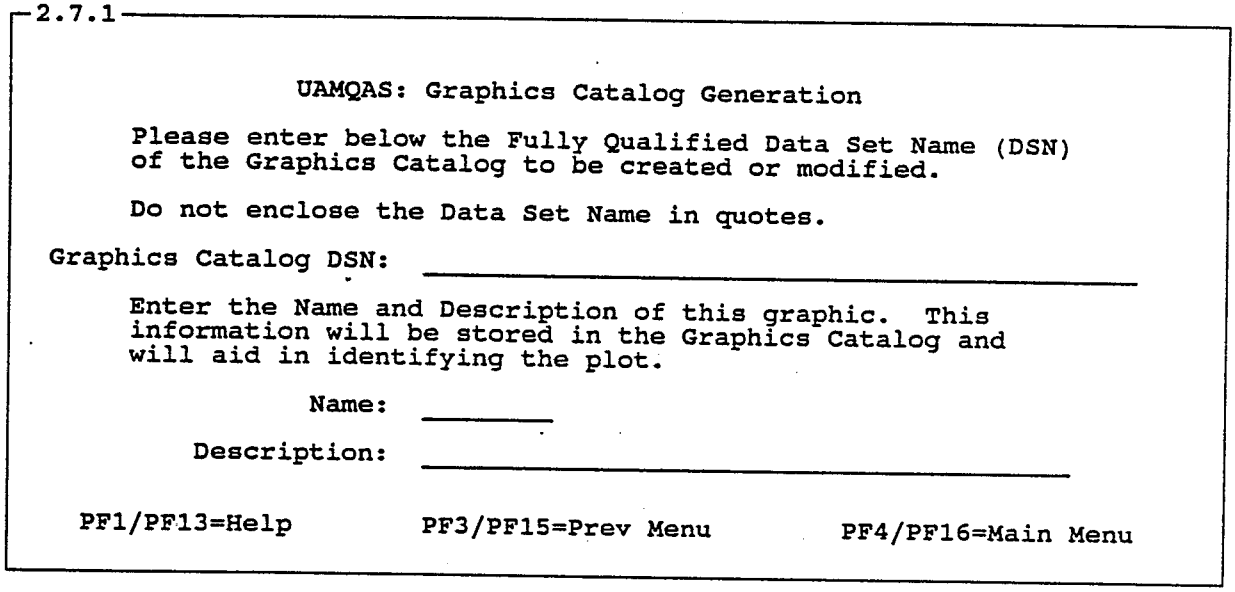


Figure 5-18. *Graphics Catalog Generation Menu.*

Instructions

You will need to provide a data set name (DSN) for the graphics catalog, as well as a name and brief description of the graph that you have just produced. A single catalog may contain any number of graphics so you may only need to have a single catalog for all the graphics you produce. On the other hand, you may wish to have more than one catalog for organizational purposes.

The **Graphics Catalog DSN** may be any name that is acceptable to the computer system you are using. If you are using the EPA's IBM computer system at the NCC, refer to section 4.5 of this manual for an example and refer to the NCC user's guide (EPA, 1990b) for further naming conventions.

The UAMQAS will display a default **Name** and **Description** based on the graphic category and the first title line of the graph. If the default entries are not satisfactory, you may type over them with any **Name** and **Description** that you prefer. The graphic **Name** should be no

more than 8 alphanumeric characters containing no blanks, and the graphic **Description** may be up to 40 characters long and may contain blanks. Refer to section 4.5 of this manual for examples.

After you have provided names and a description in the appropriate selection fields, press <Enter> to save the graphic to the graphics catalog.

The screen will then display the *PROC GREPLAY* window; an example is shown in section 4.5 (Figure 4-15). The *PROC GREPLAY* window will allow you to verify that the graphic has been placed in the graphics catalog. For complete information on using Proc Greplay, see Chapter 36 of the SAS/GRAPH Software, Version 6 (SAS Institute, Inc., 1990).

Press <PF3> or <PF15> to return to the *Termination Selection Menu.* You may choose to produce a different graphic by selecting options 1 or 2; redisplay the same graphics with new ranges or titles by selecting 3 or 4; take another look at the current graphic by selecting option 5; save another copy of the current graph (possibly to a second catalog) by selecting option 6 again; or end the session by selecting option 7.

Error Messages

There are no error messages for the *Graphics Catalog Generation Menu.* The **Graphics Catalog DSN** field is checked by the computer system that you are using. If this data set name is not valid for the computer system, you will probably see a blank *PROC GREPLAY* window without any entry corresponding to the **Name** and **Description** fields that you entered. (The exact response to an invalid data set name is dependent on the computer system that you are using.) The **Name** field will be checked by the SAS system. If the **Name** that you have entered is not a valid SAS name, the system will enter the default name (i.e., the graphic name in the Name field before you typed over it).

6. FILES

This section describes the formats and contents of files created by the UAMQAS.

6.1 FORMAT

Two types of output files are created by the UAMQAS: graphics and tables. The graphics are generated and stored in a binary file using SAS/Graph software and may be replayed or reproduced on a wide variety of terminals and hard-copy devices using the SAS/Graph software. If you have access to the UAMQAS, you have access to this software.

Tables produced by the UAMQAS are saved in TSO data sets as text files. These files are sequential data sets with a record length of 133 and record format of fixed-block-A. Because the file is 133 columns wide, you will need to use the <PF11> and <PF10> keys to scroll right and left to see the whole file on your terminal in Interactive System Productivity Facility (ISPF). If you print these files, be sure that the printer device is formatted to print 132 columns by 60 lines per page. If you need help with viewing or printing, consult the user support department for the computer system that you are using.

6.2 SAS GRAPHICS CATALOG

The graphics images that you generate with the UAMQAS can be saved to a SAS Graphics Catalog for later use. The topics of generating and saving graphics are discussed in sections 4.4, 4.5, and 5.11 of this manual.

Once a graphic is saved in the catalog, it can be replayed by invoking the SAS system at the TSO READY prompt and using the GREPLAY procedure, or by selecting the **Graphics Catalog** option from the *UAMQAS Main Menu*. This option provides a shortcut to the GREPLAY procedure and substantially reduces the need for knowledge of SAS programming. The **Graphics Catalog** option is common to both the UAMQAS and the UAMPPS, and is described in detail in section 4.3 of the UAMPPS user's guide (EPA, 1990a); see Appendix B of this manual. The GREPLAY procedure is described in Chapter 36 of SAS/GRAPH Software, Version 6 (SAS Institute, Inc., 1990). The image can be displayed or printed on any SAS-supported device, regardless of the device on which it was generated. For example, if you created a graphic using an IBM 3179G terminal and saved it to a graphics catalog, you can use the SAS command, PROC GREPLAY, or the Graphics

Catalog option to display this graphic on a Tektronix 4211 terminal or any other device supported by SAS.

For a list of SAS-supported devices, invoke SAS from the TSO READY prompt and submit the program statement "PROC GDEVICE; RUN;" in the Program Editor window of the SAS Display Manager. The SAS system will then display a scrollable list of close to 700 devices that are currently supported on the EPA's IBM system at the NCC.

This list has also been output to a JUSD data set which you may browse and/or print. The fully qualified data set name is: JUSD.SASGRAPH.V6.DATA(DEVICES). Note that the parentheses in the data set name indicate that DEVICES is a member in a partitioned data set. You may find that other members in this data set are very helpful; in particular, members CAL5845, CGM, DEVNOTES, and EXPORT. For assistance, contact the EPA's NCC User Support Department (see section 1.4).

6.3 TABLES

For each graph generated by the UAMQAS, an accompanying table lists the values that have been plotted on the graph. For each point plotted on the graph, there is a corresponding value or pair of values. The titles used in each graph are repeated in the table. In addition for spatial, 3-dimensional, and wind graphs, each table of plotted data values has a footnote at the bottom of each page corresponding to the label that appears in the lower right corner of each graph. In section 2, Figure 2-2 shows a time-series plot of domain averages and Figure 2-5 shows its accompanying table. By referring to the titles and footnotes, there should be no problem determining which table goes with which graph.

The spatial graphic will produce a table of plotted values. The table lists cell values used in plotting the map. This table is illustrated in Figure 6-1. The title lines duplicates the title that will appear on the graph. Note that the table of "Predicted Concentration Levels" lists rows in descending order. This order holds the rows in the same relative relationship as that seen in the spatial graphic. That is, the value that is listed in the upper right corner of the table is the same value that is plotted in the upper right corner of the spatial graphic.

Three-dimensional bubble plots and wind vector charts will produce similar tables. Because the wind vector charts represent both wind speed and direction, these tables present this information in the format "wind_speed/direction", e.g., 12564/135. This example represents a wind speed of 12564 meters per hour at a compass angle of 135 degrees, or southeasterly direction.

MAXIMUM O3 VALUES FOR LEVEL 1 FOR NEW YORK
FROM HOUR 1 ON 11JUL88 THROUGH HOUR 24 ON 11JUL88

ROW NUMBER (Y)	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30
24	52	52	52	52	54	55	57	57	57	58	59	60	62	64	65	68	70	71	71	70	70	70	71	74	76	77	78	78	79
23	53	52	52	53	55	57	59	59	59	60	62	63	66	68	70	72	74	75	75	75	76	75	77	80	82	84	85	85	85
22	53	53	53	55	57	59	61	61	61	62	64	65	68	70	72	75	76	77	79	79	80	80	81	84	86	87	88	89	89
21	54	53	54	56	59	61	63	63	63	64	66	68	70	72	74	77	79	81	82	83	84	85	86	89	90	91	92	91	91
20	55	55	56	59	61	64	66	65	65	66	67	69	71	73	75	78	81	83	86	87	89	89	90	92	93	95	96	96	96
19	57	57	59	61	64	67	69	67	67	67	69	70	72	75	77	80	83	86	89	90	91	91	92	94	95	97	98	99	98
18	59	59	61	64	66	69	70	68	69	70	71	73	75	77	79	83	86	88	90	91	92	93	95	97	98	99	99	100	99
17	61	62	64	66	69	71	72	71	70	71	72	73	76	78	80	84	87	89	92	94	96	98	100	101	101	100	100	101	100
16	64	64	66	69	71	73	73	71	71	73	74	76	78	80	83	86	89	92	95	97	100	102	103	103	102	101	100	100	99
15	66	66	68	71	73	73	72	71	72	74	77	78	81	84	86	90	93	96	98	101	103	103	103	101	100	98	97	96	95
14	68	68	70	72	74	73	72	70	73	77	79	81	84	87	90	93	96	98	100	102	103	103	102	101	99	98	97	96	95
13	69	69	71	73	74	73	71	72	75	78	80	83	86	90	92	95	98	99	100	101	101	101	101	101	100	100	98	97	96
12	70	70	72	74	74	72	71	74	76	79	82	85	88	92	95	98	100	99	99	99	99	99	99	100	100	99	98	97	96
11	70	71	72	74	74	72	72	75	77	80	83	86	89	93	97	99	99	99	99	99	100	100	100	101	101	101	100	99	98
10	70	72	73	75	74	71	71	75	78	81	85	87	91	95	98	99	99	99	100	102	104	105	106	106	106	105	104	103	102
9	70	72	73	75	74	72	72	76	78	80	83	86	90	94	94	95	96	98	100	103	104	106	107	107	107	107	106	105	103
8	71	73	73	74	73	71	71	75	77	78	81	84	86	90	91	93	95	98	101	104	106	107	108	108	108	107	106	104	102
7	72	73	73	74	73	72	72	74	74	76	79	81	83	86	87	91	94	98	101	103	105	106	107	107	106	105	102	101	98
6	72	73	72	74	73	73	78	80	81	81	83	84	85	88	89	92	96	99	101	103	105	105	105	104	102	100	98	96	92
5	73	73	73	75	72	78	82	84	85	85	85	85	86	89	91	94	97	100	101	102	102	102	101	99	97	95	92	91	87
4	74	75	75	77	80	83	85	86	86	86	87	86	87	89	92	95	97	99	100	100	99	98	97	94	92	90	87	85	81
3	76	78	80	82	85	88	89	89	89	89	89	88	89	91	94	96	97	98	98	97	96	94	92	89	86	84	81	79	76
2	80	83	86	88	89	91	91	92	92	91	91	91	92	93	95	95	96	96	95	94	92	89	87	84	82	79	77	76	73

MAP1 DATA

Figure 6-1. *Spatial graphic tables.*

Temporal graphics generate a table similar to the one shown in Figure 6-2. The titles of the table match the titles of the plot show which table is associated with which graph. There is a corresponding date and hour for each data point. Labels at the top of the data column(s) indicate the parameter(s) plotted.

TEMPERATURE GRADIENT VALUES FOR LOS ANGELES
FROM HOUR 14 ON 26AUG THROUGH HOUR 00 ON 27AUG
FROM METSCALARS INPUT FILE

OBS	Date:Hour	Temp. Gradient Above Diff. Break (K/m)	Temp. Gradient Below Diff. Break (K/m)
1	26AUG87:14	0.010000	-.0080000
2	26AUG87:15	0.010000	-.0080000
3	26AUG87:16	0.010000	-.0070000
4	26AUG87:17	0.010000	-.0070000
5	26AUG87:18	0.010000	-.0070000
6	26AUG87:19	0.010000	-.0070000
7	26AUG87:20	0.011000	-.0070000
8	26AUG87:21	0.011000	-.0060000
9	26AUG87:22	0.012000	-.0060000
10	26AUG87:23	0.013000	-.0050000
11	27AUG87:00	0.014000	-.0050000

Figure 6-2. *Temporal graphics table*

7. REFERENCES

EPA. 1990a. User's Guide for the Urban Airshed Model. Volume VI: User's Manual for the Postprocessing System. U.S. Environmental Protection Agency. EPA-450-90-007F. Research Triangle Park, NC.

EPA. 1990b. Guide to NCC Services. U.S. Environmental Protection Agency. National Computer Center. Research Triangle Park, NC.

EPA. 1991a. Guideline for Regulatory Application of the Urban Airshed Model. U.S. Environmental Protection Agency. EPA-450/4-91-013. Research Triangle Park, NC.

SAS Institute Inc. 1990. SAS/GRAPH Software: Reference. Version 6, First Edition, Volume 1. SAS Institute, Incorporated. Cary, NC.

APPENDIX A

EXTRACT MODULE FOR UAMQAS

Data Extraction

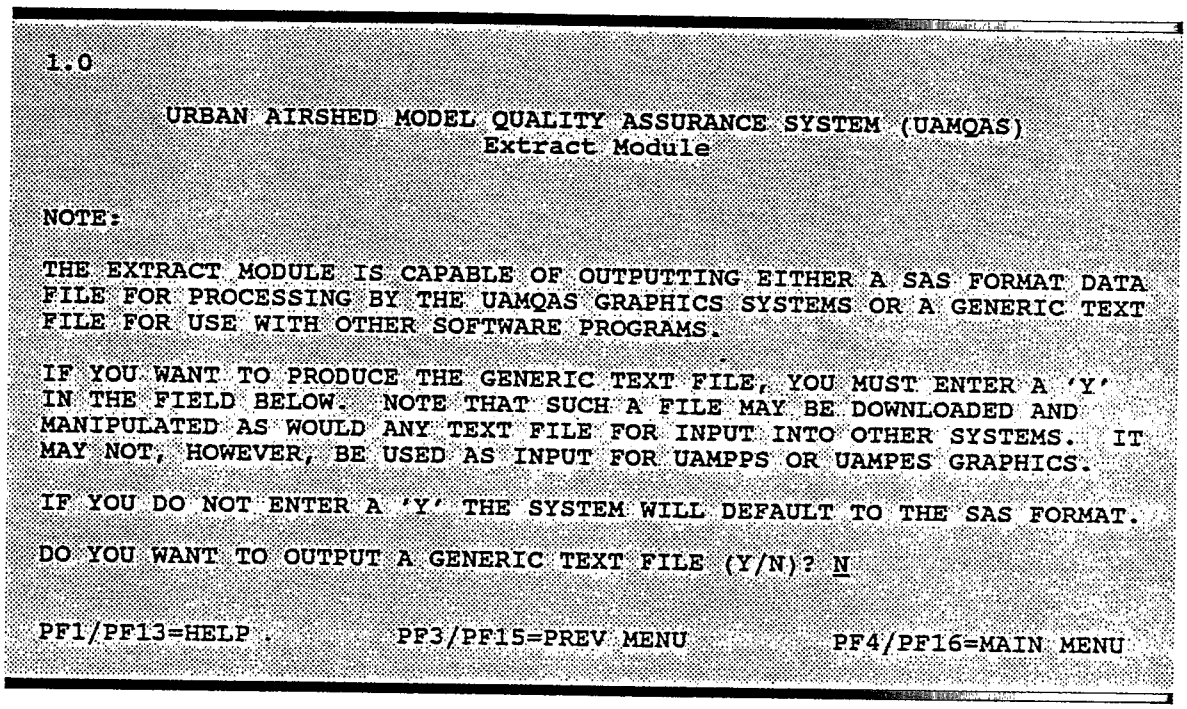
The input files to the UAM contain a variety of data. You can extract one of nine files, AIRQUALITY, DIFFBREAK, EMISSIONS, METSCALARS, REGIONTOP, TEMPERATUR, TERRAIN, or WIND. The extraction process transforms the data into a generic text file or a SAS formatted file used in the graphics module. Since each of these files contain different information and formats, they are extracted in one of three menu sequences.

Extraction for AIRQUALITY, EMISSIONS, and TOPCONC files

The extraction for AIRQUALITY, EMISSIONS, and TOPCONC is identical to the UAM Postprocessing System (UAMPPS) extraction. These files contain gridded data for 24 species (See Table A-1), and a variable number of levels. The extract module for these input files provides the capability for subsetting the data based on species and level. The remainder or this section shows you the sequence of screens for extracting AIRQUALITY, EMISSIONS, or TOPCONC data.

Table A-1. DEFINITION OF THE UAM (CB-IV) STATE SPECIES

UAM species	Species name
NO	Nitric oxide
NO2	Nitrogen dioxide
O3	Ozone
OLE	Olefinic carbon bond(C=C)
PAR	Paraffinic carbon bond(C-C)
TOL	Toluene (C_6H_5-CH_3)
XYL	Xylene (C_6H_6-$(CH_3)_2$)
FORM	Formaldehyde (CH_2=O)
ALD2	High molecular weight aldehydes (RCHO, R>H)
ETH	Ethane (CH_2=CH_2)
CRES	Cresol and higher molecular weight phenols
MGLY	Methyl glyoxal ($CH_3C(O)C(O)H$)
OPEN	Aromatic ring fragment acid
PNA	Peroxynitric acid (HO_2NO_2)
NXOY	Total of nitrogen compounds ($NO + NO_2 + N_2O_5 + NO_3$)
PAN	Peroxyacyl nitrate ($CH_3C(O)O_2NO_2$)
CO	Carbon monoxide
HONO	Nitrous acid
H2O2	Hydrogen peroxide
HNO3	Nitric acid
MEOH	Methanol (optional)
ETOH	Ethanol (optional)
ISOP	Isoprene (optional)
CLBR	Calibration



The *Extract Module Startup Screen* gives you an opportunity to specify what type of output file will be produced by the extract. The default output file is an extracted SAS-formatted data set, which is used as input for the UAMQAS graphics module. You may choose to output a generic text file by entering a "Y" at the prompt. If you enter anything other than the "Y" or nothing at all, the SAS-formatted data set will be produced.

The default naming convention for the extracted output file is as follows:

uidacct.UAM.ftyp.PREPRC.study.spec.Xddmmmyy.intype

where:

	uid	=	your User ID supplied by the NCC
	acct	=	your account supplied by the NCC
	ftyp	=	SASD for SAS-formatted data sets; or TEXT for generic text files
	study	=	the study abbreviation from which you are extracting data
	spec	=	the species you are extracting in this run
	dd	=	the starting day of the UAM run
	mmm	=	the starting month of the UAM run (JAN, FEB, MAR, etc.)
	yy	=	the starting year of the UAM run
	intype	=	the type of input file you are extracting (EMS, TOP, ARQ)

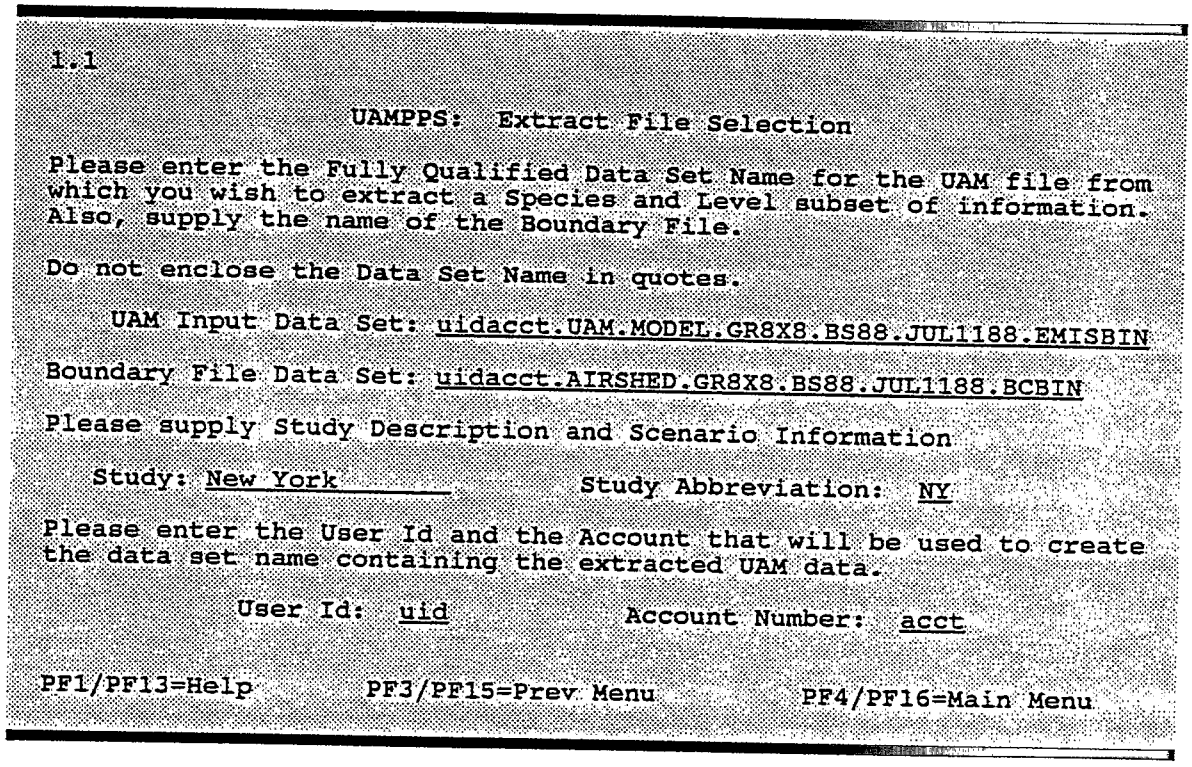
The user has the option to change the output file name just before extracting the data (screen 1.3). Note that, if you are attempting to perform an extraction for a given species, start date combination, and input file that has previously been performed and the user did not change the output file name, the existing file will be deleted and the results of the present extraction will be contained in a data set with the same name.

Instructions:

Press **ENTER** to continue. Press **PF4** or **PF16** to abort the extract and return to the main menu.

Error Messages:

None.



The information requested on the *Extract File Selection Screen* is used to determine the name of the extracted data set and to provide some information on its name and location.

Instructions:

The user must supply the fully qualified names of both the UAM input file from which you wish to extract data and the UAM boundary file. Do **NOT** enclose the data set name in quotes. Please note that the input file should be binary and not ASCII or EBCDIC and must be a cataloged disk file residing on the NCC IBM mainframe.

Generally, the name of the domain is placed in the "Study" and the abbreviation of the domain is placed in the "Study Abbreviation" fields, although you may choose any type of identifier.

Finally, you must supply User ID and account information in order to determine the prefix of the output data set being created. These two pieces of information were supplied to you by the NCC when you received your IBM account authorization.

When you are finished specifiying all of the neccessary information, press **ENTER** to process your selections.

Error Messages:

Entering an invalid file name on either the "UAM Input Data set" field or the "Boundary File Data Set" will result in the following message displayed in the center of the screen:

```
Press ENTER to continue
        DATA SET DOES NOT EXIST.  PLEASE REENTER DATA SET NAME.
```

If the geographical boundaries in the boundary file do not fall within the geographical domain of the data file, the following message will appear:

```
Press ENTER to continue
        FILE DOMAINS ARE INCOMPATIBLE... REENETER ONE OR BOTH
```

If you try to extract data from an UAM input file that is not one of the previously listed files, the following message will appear:

```
Press ENTER to continue
      INVALID INPUT FILE FORMAT.  REENTER FILE NAME TO CONTINUE
```

All other fields on the screen are required. If you leave any of these fields blank, the following message will result:

```
Press ENTER to continue
                    VALUE REQUIRED AT CURSOR LOCATION
```

When you press **ENTER** to continue, the cursor will be placed on the appropriate field for you to correct the data set names or input necessary information.

```
1.2

                UAMQAS:  Extract Species/Level Data

Model Run
      Start Day: 11JUL88    Hour: 1      End Day: 11JUL88    Hour: 24
      Number of Species:  24

Domain
      Columns(x):  31                 Rows(y):  25
      Vertical Levels(z):  5          ( Upper 3, Lower 2 )

Enter a ? and Press Enter to Select from a List of Available Species

Select Species:  O3                          Select Level:  1

          Press PF20 for a Spatial Description of the Domain.

   PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

```
1.2

          UAMQAS:  Extract Spatial Description of the Domain

UTM Zone:  18
Reference Origin (x):          0        Reference Origin(y):          0
Origin of Grid(x):        520000        Origin of Grid(y):    4460000

Columns(x):  31                         Rows(y):  25
Grid Interval(x):  8000                 Grid Interval(y):  8000

Vertical Levels(z):  5                  ( Upper 3 , Lower 2 )
Height to Base of Surface Level:     0
Minimum Height to Lower Level:      50
Minimum Height to Upper Level:     150

Press PF19 to return to the Species/Level Data Extraction Menu.

   PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

The *Extract Species/Level Screen* is a 2-page screen. Page 1 of this screen lists the starting and ending periods of the UAM input data and the species present, along with some spatial information. Page 2 is purely informational, showing the spatial description of the domain. The number of columns, rows, and vertical levels are repeated from page 1 so that you will not have to page back and forth to see a complete spatial description of the domain.

Instructions:

On page 1 of this screen, you are asked to supply the name of the species and the number of the level from which you would like data extracted. The name of the species must match one of the names supplied in the list of available species. If you enter a "?" in the "Select Species" field and press **ENTER**, a list of available species will be displayed. You may select a species by placing the cursor on a member of the list and pressing **ENTER**. The level you select must be less than or equal to the total number of vertical levels.

When you are finished specifying all the necessary information, press **ENTER** to process your selections.

Error Messages:

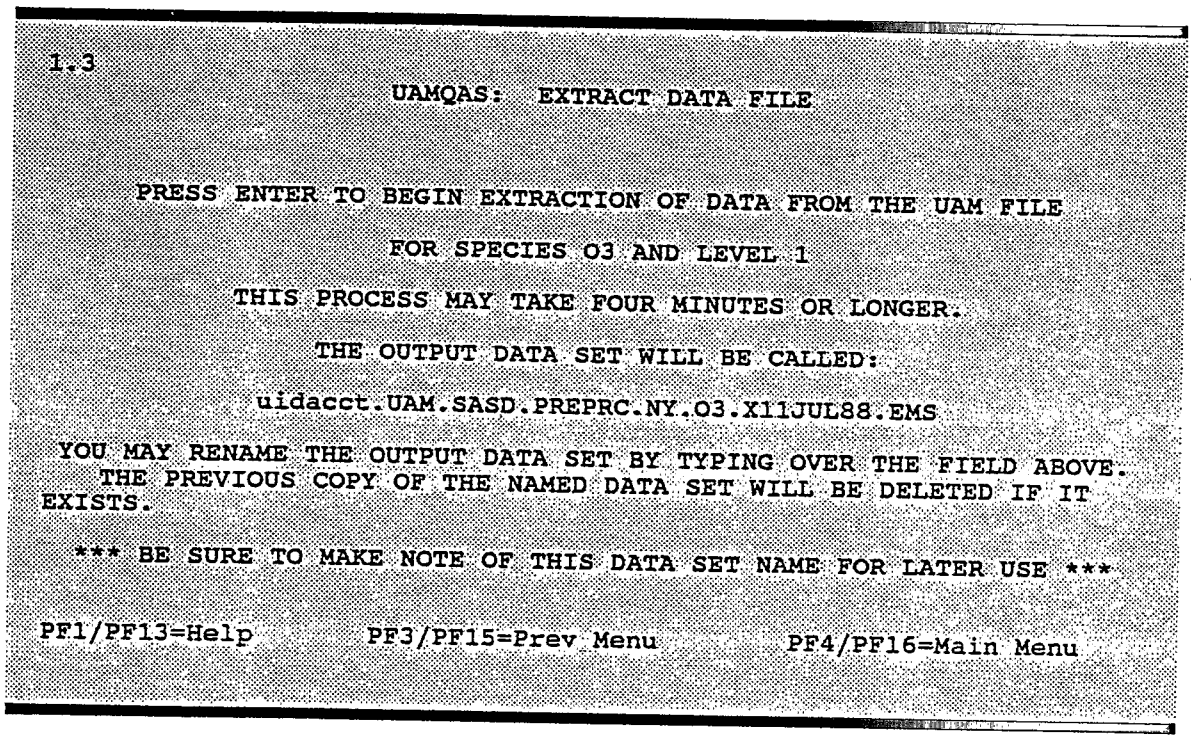
If the "Select Species" field is left blank or the species enterd is not a valid species, the following message is displayed:

```
┌Press ENTER to continue──────────────────────────────────────────────┐
│                                                                     │
│                    INVALID SPECIES...PLEASE REENTER                 │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

The "Select Level" field must be less than or equal to the number of vertical levels in the domain. If this in no the case, the following message will be displayed:

```
┌Press ENTER to continue──────────────────────────────────────────────┐
│                                                                     │
│          SELECT LEVEL FIELD OUTSIDE VALID RANGE...REENTER           │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

When you press **ENTER** to continue, the cursor will be placed on the appropriate field for data entry.



After the *Species/Level Data Selection Screen* in completed, the extraction process can begin. This screen is displaying indicating the species and level being extracted along with the name of the output data set containing the extracted data. The program supplies you with a default output dataset name. If you so desire, you can change the name of the output data set. You should make a note of the name of the data set that is being created. When you enter the graphics module, you will need to supply this or another extracted data set name. Therefore, it is recommended that you keep a list containing the names of all data sets you extract along with a brief description of their contents.

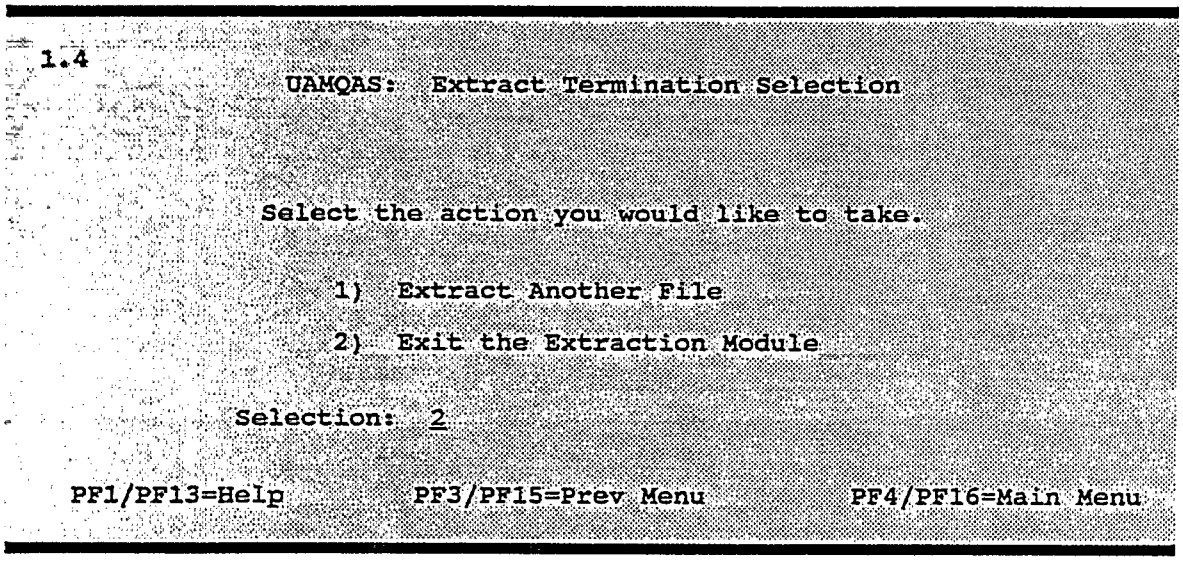
Instructions:

If you wish to change the name of the output data set, press **TAB** to move the cursor to the output data set field and type over the existing default name. Make note of the name of the extracted data set and be sure to write it down for later use. Remember, this data set name is required by the UAMQAS graphics module.

Because large data files are involved, the extraction process may take 4 minutes or longer.

Error Messages:

None.



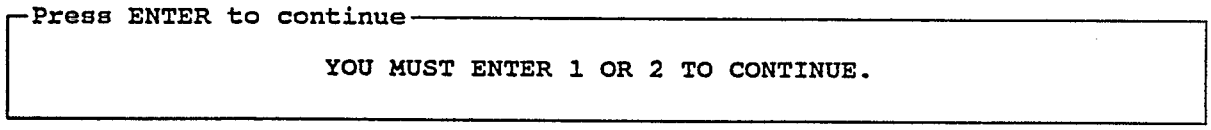
The *Extract Termination Selection Screen* will appear at the end of the extraction. This screen allows you to perform another extraction or to exit the extract module.

Instructions:

To perform another extraction enter "1" in the "Selection" field, otherwise, enter "2" to exit the extract module. If you choose to extract more data, you will be returned to the *Extract Module Startup Screen*. If you choose to exit the extract module, you will be returned to the *UAMQAS Main Menu*.

Error Messages:

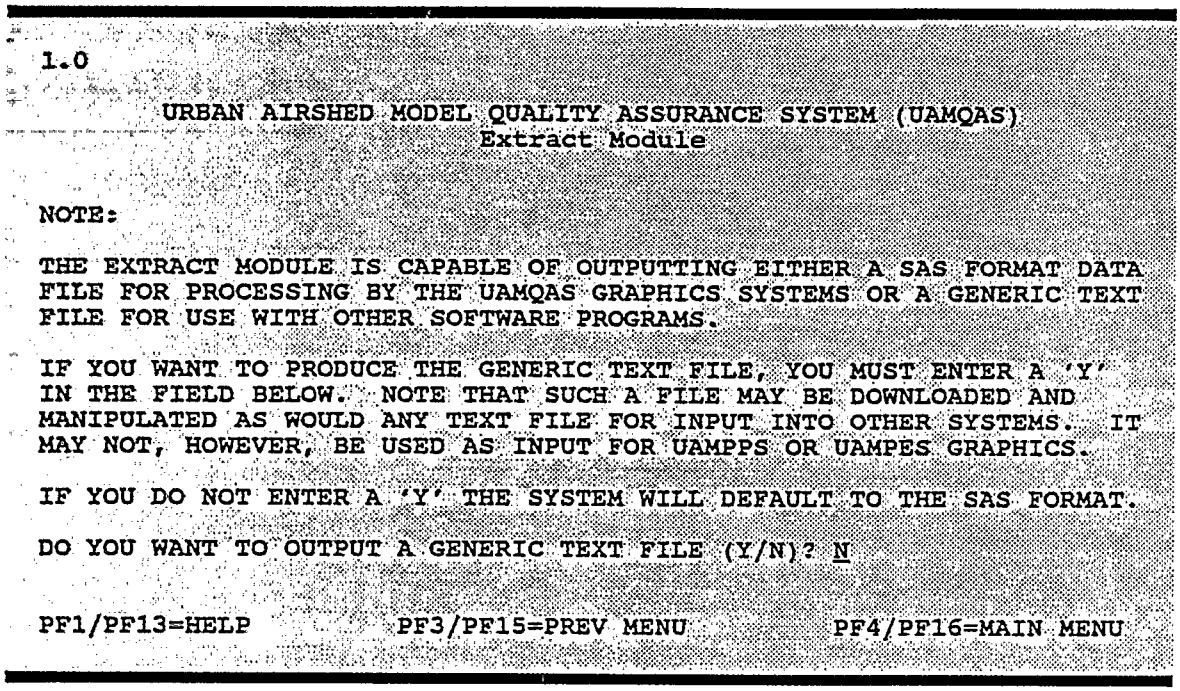
The values "1" or "2" are the only valid values for the "Selection" field. Any other entry will result in the following error message:



Press **ENTER** to remove the message from the screen. Then, enter a "1" or "2" and press **ENTER** to process your selection.

Extraction for WIND files

The extraction for a WIND file is similar to the extraction process for AIRQUALITY, EMISSIONS, and TOPCONC files. The WIND binary file contains hourly gridded wind components for each UAM layer. The extraction subsets the data to a specific level and outputs the gridded components for the selected level to a data set. The remainder of this section shows the sequence of screens you will see when extracting WIND data. Some of them are the same or similar to the screens used to extract AIRQUALITY, EMISSIONS, or TOPCONC data.



The *Extract Module Startup Screen* gives you an opportunity to specify what type of output file will be produced by the extract. The default output file is an extracted SAS-formatted data set, which is used as input for the UAMQAS graphics module. You may choose to output a generic text file by entering a "Y" at the prompt. If you enter anything other than the "Y" or nothing at all, the SAS-formatted data set will be produced.

The default naming convention for the extracted output file is as follows:

uidacct.UAM.ftyp.PREPRC.study.Llevel.Xddmmmyy.intype

where:	uid	=	your User ID supplied by the NCC
	acct	=	your account supplied by the NCC
	ftyp	=	SASD for SAS-formatted data sets; or TEXT for generic text files
	study	=	the study abbreviation from which you are extracting data
	level	=	the level or layer of gridded components being extracted
	dd	=	the starting day of the UAM run
	mmm	=	the starting month of the UAM run (JAN, FEB, MAR, etc.)
	yy	=	the starting year of the UAM run
	intype	=	the type of input file you are extracting (WND)

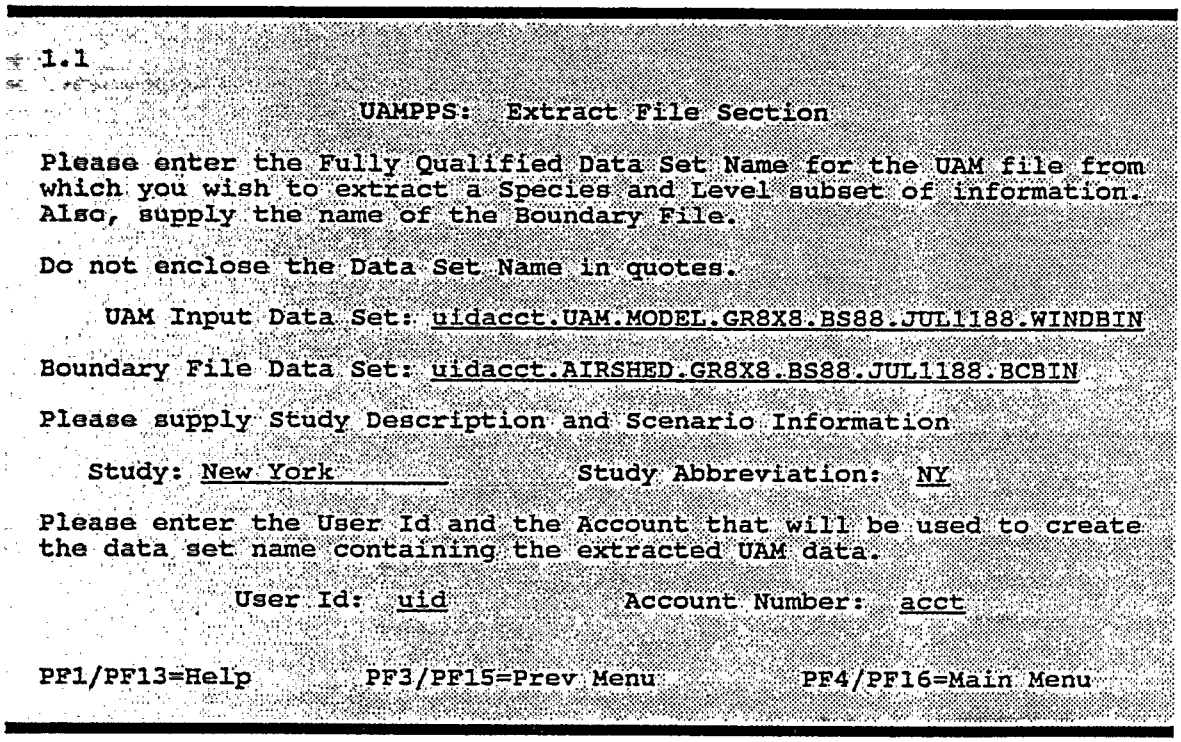
The user has the option to change the output file name just before extracting the data (screen 1.3). Note that, if you are attempting to extract WIND data for a given level, start date combination, that has previously been performed and the user did not change the output file name, the existing file will be deleted and the results of the present extraction will be contained in a data set with the same name.

Instructions:

Press **ENTER** to continue. Press **PF4** or **PF16** to abort the extract and return to the main menu.

Error Messages:

None.



The information requested on the *Extract File Selection Screen* is used to determine the name of the extracted data set and to provide some information on its name and location.

Instructions:

The user must supply the fully qualified names of bothe the UAM input file from which you wish to extract data and the UAM boundary file. Do **NOT** enclose the data set name in quotes. Please note that the input file fhould be binary and not ASCII or EBCDIC and must be a cataloged disk file residing on the NCC IBM mainframe.

Generally, the name of the domain is placed in the "Study" and the abbreviation of the domain is placed in the "Study Abbreviation" fields, although you may choose any type of identifier.

Finally, you must supply User ID and account information in order to determine the prefix of the output data set being created. These two pieces of information were supplied to you by the NCC when you received your IBM account authorization.

When you are finished specifiying all of the neccessary information, press **ENTER** to process your selections.

Error Messages:

Entering an invalid file name on either the "UAM Input Data set" field or the "Boundary File Data Set" will result in the following message displayed in the center of the screen:

```
┌Press ENTER to continue──────────────────────────────────────────────┐
│                                                                     │
│          DATA SET DOES NOT EXIST.  PLEASE REENTER DATA SET NAME.    │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

If the geographical boundaries in the boundary file do not fall within the geographical domain of the data file, the following message will appear:

```
┌Press ENTER to continue──────────────────────────────────────────────┐
│                                                                     │
│          FILE DOMAINS ARE INCOMPATIBLE... REENTER ONE OR BOTH       │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

If you try to extract data from an UAM input file that is not one of the previously listed files, the following message will appear:

```
┌Press ENTER to continue──────────────────────────────────────────────┐
│                                                                     │
│        INVALID INPUT FILE FORMAT.  REENTER FILE NAME TO CONTINUE    │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

All other fields on the screen are required. If you leave any of these fields blank, the following message will result:

```
┌Press ENTER to continue──────────────────────────────────────────────┐
│                                                                     │
│                    VALUE REQUIRED AT CURSOR LOCATION                │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘
```

When you press **ENTER** to continue, the cursor will be placed on the appropriate field for you to correct the data set names or input necessary information.

```
1.2

                UAMQAS:  Extract Wind Level Data

Model Run
      Start Day: 11JUL88    Hour: 1     End Day: 11JUL88    Hour: 24

Domain
      Columns(x):  31                Rows(y):  25
      Vertical Levels(z):  5         ( Upper 3, Lower 2 )


                        Select Level:  1


          Press PF20 for a Spatial Description of the Domain.


   PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

```
1.2

          UAMQAS:  Extract Spatial Description of the Domain

UTM Zone:  18
Reference Origin (x):          0      Reference Origin(y):          0
Origin of Grid(x):        520000      Origin of Grid(y):    4460000

Columns(x):  31                       Rows(y):  25
Grid Interval(x):  8000               Grid Interval(y):  8000

Vertical Levels(z):  5                ( Upper 3 , Lower 2 )
Height to Base of Surface Level:    0
Minimum Height to Lower Level:     50
Minimum Height to Upper Level:    150

Press PF19 to return to the Level Data Extraction Menu.


   PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

The *Extract Wind Level Data Screen* is a 2-page screen. Page 1 of this screen lists the starting and ending periods of the UAM input data and some spatial information. Page 2 is purely informational, showing the spatial description of the domain. The number of columns, rows, and vertical levels are repeated from page 1 so that you will not have to page back and forth to see a complete spatial description of the domain.

Instructions:

On page 1 of this screen, you are asked to supply the number of the level from which you would like data extracted. The level you select must be less than or equal to the total number of vertical levels.

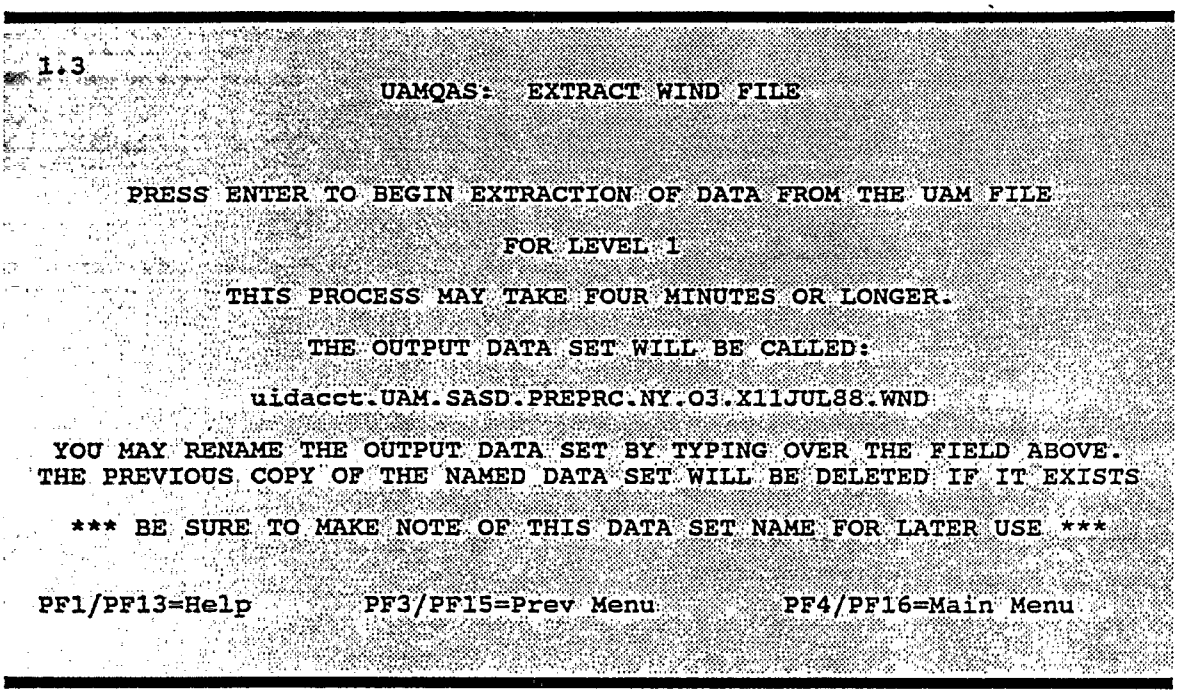
When you are finished specifying the level, press **ENTER** to process your selection.

Error Messages:

The "Select Level" field must be less than or equal to the number of vertical levels in the domain. If this in no the case, the following message will be displayed:

```
Press ENTER to continue
        SELECT LEVEL FIELD OUTSIDE VALID RANGE...REENTER
```

When you press **ENTER** to continue, the cursor will be placed on the appropriate field for data entry.



After the *Extract Wind Level Data Screen* in completed, the extraction process can begin. This screen is displaying indicating the species and level being extracted along with the name of the output data set containing the extracted data. The program supplies you with a default output dataset name. If you so desire, you can change the name of the output data set. You should make a note of the name of the data set that is being created. When you enter the graphics module, you will need to supply this or another extracted data set name. Therefore, it is recommended that you keep a list containing the names of all data sets you extract along with a brief description of their contents.

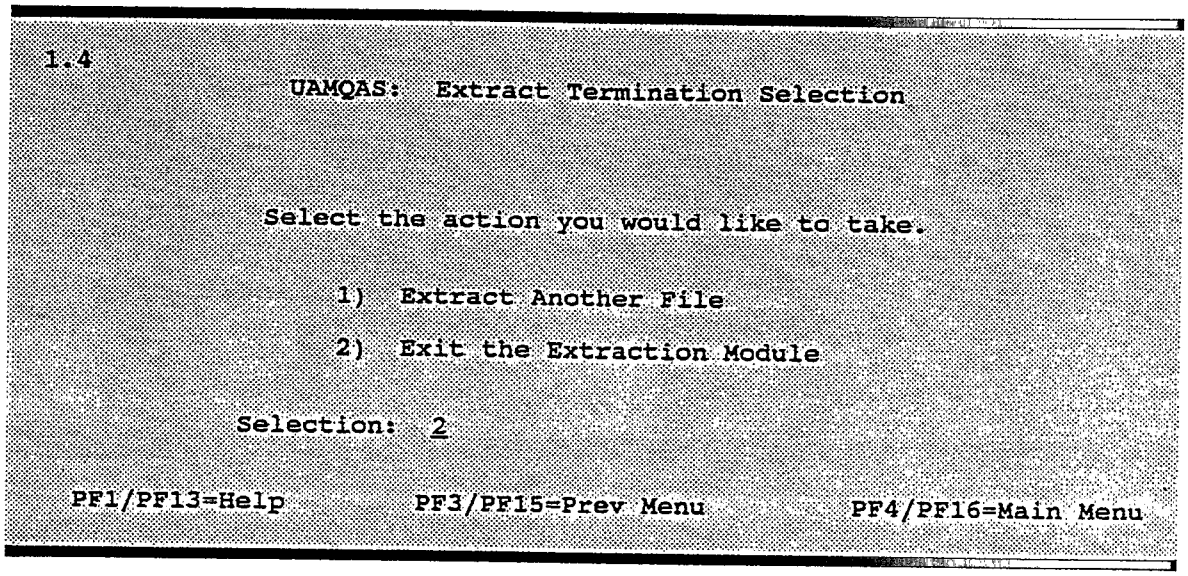
Instructions:

If you wish to change the name of the output data set, press **TAB** to move the cursor to the output data set field and type over the existing default name. Make note of the name of the extracted data set and be sure to write it down for later use. Remember, this data set name is required by the UAMQAS graphics module.

Because large data files are involved, the extraction process may take 4 minutes or longer.

Error Messages:

None.



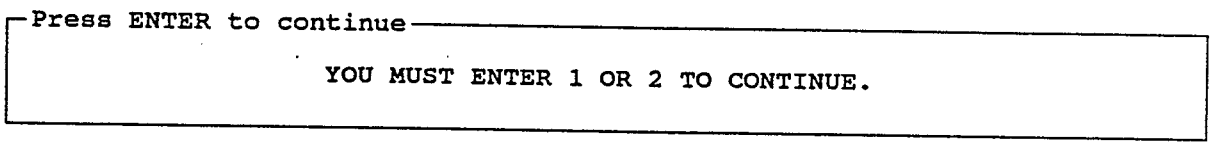
The *Extract Termination Selection Screen* will appear at the end of the extraction. This screen allows you to perform another extraction or to exit the extract module.

Instructions:

To perform another extraction enter "1" in the "Selection" field, otherwise, enter "2" to exit the extract module. If you choose to extract more data, you will be returned to the *Extract Module Startup Screen*. If you choose to exit the extract module, you will be returned to the *UAMQAS Main Menu*.

Error Messages:

The values "1" or "2" are the only valid values for the "Selection" field. Any other entry will result in the following error message:



Press **ENTER** to remove the message from the screen. Then, enter a "1" or "2" and press **ENTER** to process your selection.

Extraction for DIFFBREAK, METSCALARS, REGIONTOP, TEMPERATUR, and TERRAIN files

The extraction of the DIFFBREAK, METSCALARS, REGIONTOP, TEMPERATUR, and TERRAIN files is a little simplier than the extractions explained previously. These files contain data for meteorological or land use inputs. The data varies temporally or spatially for the entire domain. Since there are no species or levels in these input files, there is no subsetting and the extraction outputs the entire file to a data set. The remainder of this section shows the sequence of screens you will see when extracting DIFFBREAK, METSCALARS, REGIONTOP, TEMPERATUR, or TERRAIN data.

```
1.0

        URBAN AIRSHED MODEL QUALITY ASSURANCE SYSTEM (UAMQAS)
                              Extract Module

NOTE:

THE EXTRACT MODULE IS CAPABLE OF OUTPUTTING EITHER A SAS FORMAT DATA
FILE FOR PROCESSING BY THE UAMQAS GRAPHICS SYSTEMS OR A GENERIC TEXT
FILE FOR USE WITH OTHER SOFTWARE PROGRAMS.

IF YOU WANT TO PRODUCE THE GENERIC TEXT FILE, YOU MUST ENTER A 'Y'
IN THE FIELD BELOW.  NOTE THAT SUCH A FILE MAY BE DOWNLOADED AND
MANIPULATED AS WOULD ANY TEXT FILE FOR INPUT INTO OTHER SYSTEMS.  IT
MAY NOT, HOWEVER, BE USED AS INPUT FOR UAMPPS OR UAMPES GRAPHICS.

IF YOU DO NOT ENTER A 'Y' THE SYSTEM WILL DEFAULT TO THE SAS FORMAT.

DO YOU WANT TO OUTPUT A GENERIC TEXT FILE (Y/N)? N

PF1/PF13=HELP        PF3/PF15=PREV MENU        PF4/PF16=MAIN MENU
```

The *Extract Module Startup Screen* gives you an opportunity to specify what type of output file will be produced by the extract. The default output file is an extracted SAS-formatted data set, which is used as input for the UAMQAS graphics module. You may choose to output a generic text file by entering a "Y" at the prompt. If you enter anything other than the "Y" or nothing at all, the SAS-formatted data set will be produced.

The default naming convention for the extracted output file is as follows:

uidacct.UAM.ftyp.PREPRC.study.NOSP.Xddmmmyy.intype

where:

	uid	=	your User ID supplied by the NCC
	acct	=	your account supplied by the NCC
	ftyp	=	SASD for SAS-formatted data sets; or TEXT for generic text files
	study	=	the study abbreviation from which you are extracting data
	dd	=	the starting day of the UAM run
	mmm	=	the starting month of the UAM run (JAN, FEB, MAR, etc.)
	yy	=	the starting year of the UAM run
	intype	=	the type of input file you are extracting (DIF, MET, REG, TMP, or TER)

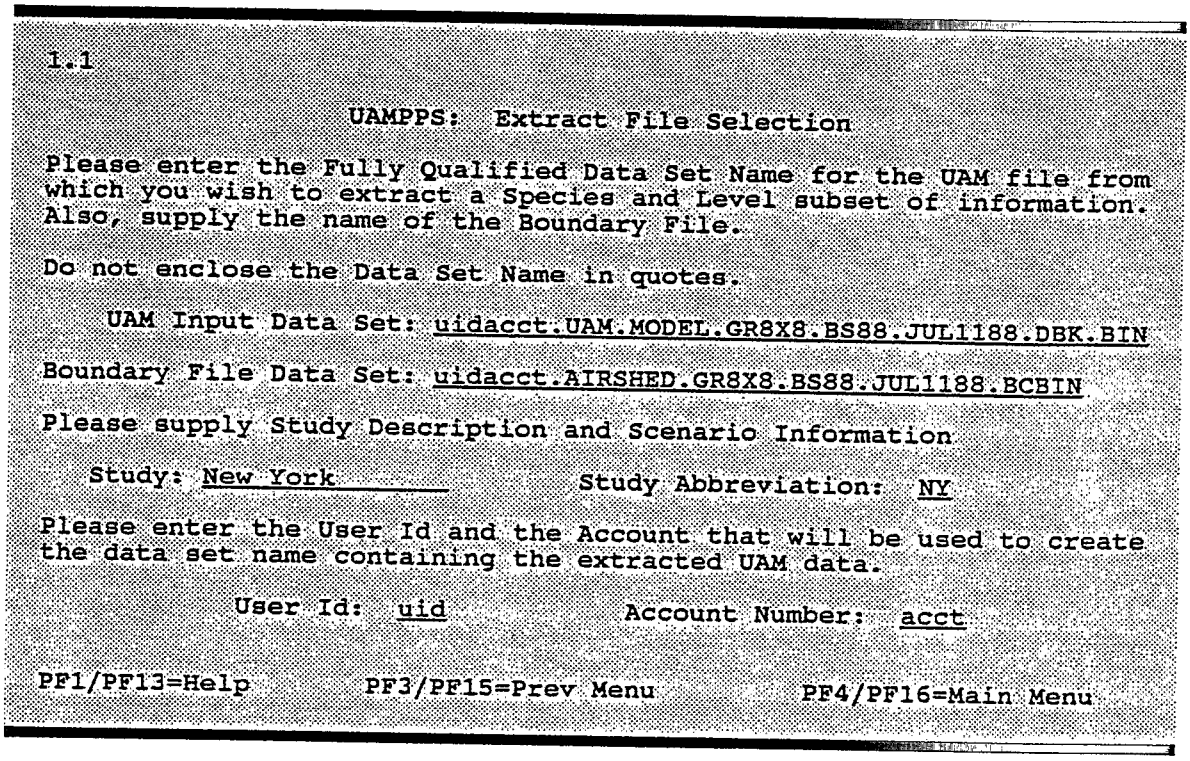
The user has the option to change the output file name just before extracting the data (screen 1.3). Note that, if you are attempting to extract a specific input file for a start date combination, that has previously been performed and the user did not change the output file name, the existing file will be deleted and the results of the present extraction will be contained in a data set with the same name.

Instructions:

Press **ENTER** to continue. Press **PF4** or **PF16** to abort the extract and return to the main menu.

Error Messages:

None.



The information requested on the *Extract File Selection Screen* is used to determine the name of the extracted data set and to provide some information on its name and location.

Instructions:

The user must supply the fully qualified names of both the UAM input file from which you wish to extract data and the UAM boundary file. Do **NOT** enclose the data set name in quotes. Please note that the input file fhould be binary and not ASCII or EBCDIC and must be a cataloged disk file residing on the NCC IBM mainframe.

Generally, the name of the domain is placed in the "Study" and the abbreviation of the domain is placed in the "Study Abbreviation" fields, although you may choose any type of identifier.

Finally, you must supply User ID and account information in order to determine the prefix of the output data set being created. These two pieces of information were supplied to you by the NCC when you received your IBM account authorization.

When you are finished specifiying all of the neccessary information, press **ENTER** to process your selections.

Error Messages:

Entering an invalid file name on either the "UAM Input Data set" field or the "Boundary File Data Set" will result in the following message displayed in the center of the screen:

```
Press ENTER to continue
        DATA SET DOES NOT EXIST.  PLEASE REENTER DATA SET NAME.
```

If the geographical boundaries in the boundary file do not fall within the geographical domain of the data file, the following message will appear:

```
Press ENTER to continue
        FILE DOMAINS ARE INCOMPATIBLE... REENTER ONE OR BOTH
```

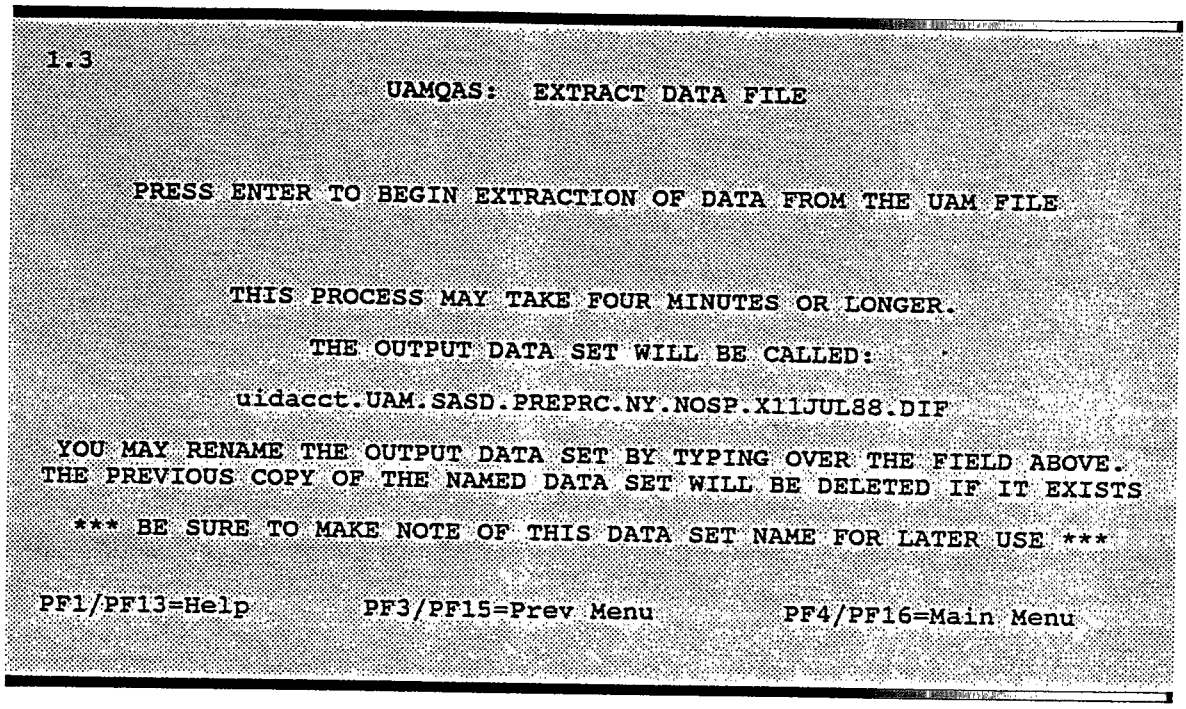
If you try to extract data from an UAM input file that is not one of the previously listed files, the following message will appear:

```
Press ENTER to continue
      INVALID INPUT FILE FORMAT.  REENTER FILE NAME TO CONTINUE
```

All other fields on the screen are required. If you leave any of these fields blank, the following message will result:

```
Press ENTER to continue
                    VALUE REQUIRED AT CURSOR LOCATION
```

When you press **ENTER** to continue, the cursor will be placed on the appropriate field for you to correct the data set names or input necessary information.



After the *Extract File Selection Screen* has completed, the data can now be extracted. This screen is displaying the name of the default output data set containing the extracted data. The example above is for a DIFFBREAK input file. Each of the other input file types have a similar screen with the exception of the TERRAIN file. The TERRAIN outputs two data sets, one with for the roughness and one for the vegatation. You have the option to change the name of the output data set if you so desire. You should make a note of the name of the data set that is being created. When you enter the graphics module, you will need to supply this or another extracted data set name. Therefore, it is recommended that you keep a list containing the names of all data sets you extract along with a brief description of their contents.

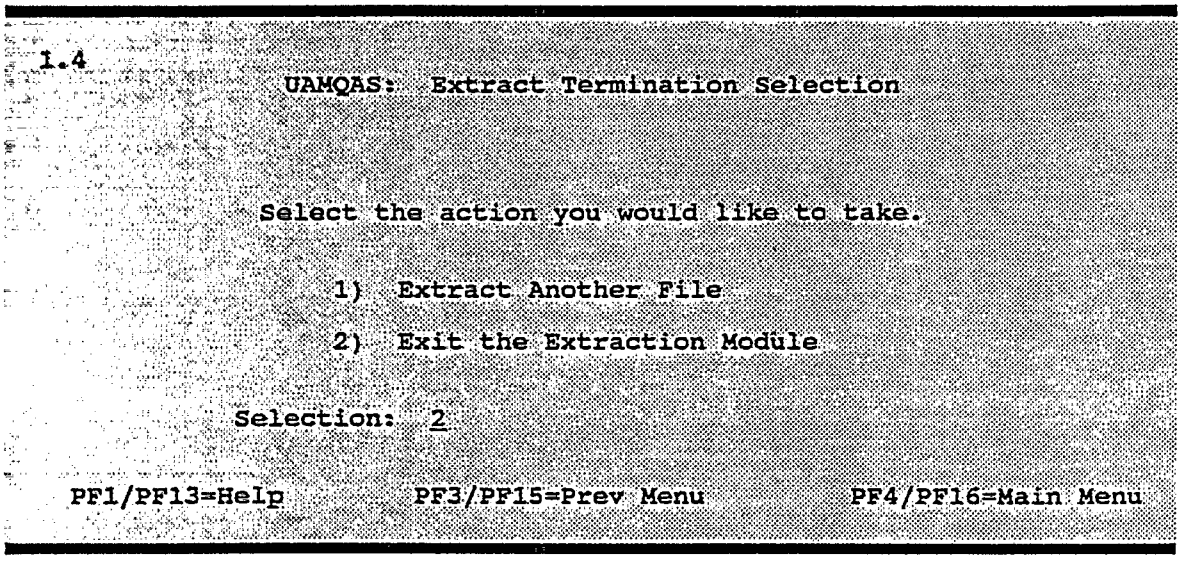
Instructions:

If you wish to change the name of the output data set, press **TAB** to move the cursor to the first output data set field and type over the existing default name. For a TERRAIN file, press **TAB** again to move the cursor to the second output data set field and type over the existing name if you wish to change that name also. Make note of the name of the extracted data set and be sure to write it down for later use. Remember, this data set name is required by the UAMQAS graphics module.

Because large data files are involved, the extraction process may take 4 minutes or longer.

Error Messages:

None.



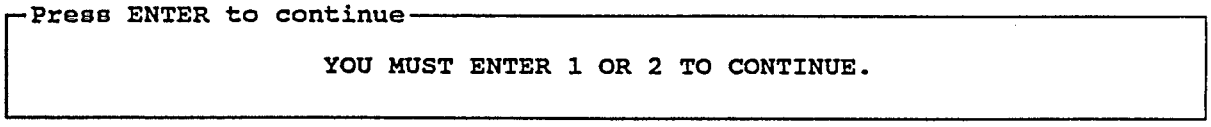
The *Extract Termination Selection Screen* will appear at the end of the extraction. This screen allows you to perform another extraction or to exit the extract module.

Instructions:

To perform another extraction enter "1" in the "Selection" field, otherwise, enter "2" to exit the extract module. If you choose to extract more data, you will be returned to the *Extract Module Startup Screen*. If you choose to exit the extract module, you will be returned to the *UAMQAS Main Menu*.

Error Messages:

The values "1" or "2" are the only valid values for the "Selection" field. Any other entry will result in the following error message:



Press **ENTER** to remove the message from the screen. Then, enter a "1" or "2" and press **ENTER** to process your selection.

APPENDIX B

GRAPHICS CATALOG MODULE

from the UAMPPS User's Guide

4.3 GRAPHICS CATALOG

Within the SAS data management system, the Graphics Catalog is the storage area for the graphics command string that produces graphic output from the processed data. The resulting graphic data can be "replayed" to redisplay the graphic much more rapidly than repeating the graphic.generation process. A temporary graphics catalog is always produced when SAS graphics procedures are run, but this temporary catalog and its contents are lost when the SAS session is concluded.

To save graphics output between SAS sessions, you must specify a permanent graphics catalog. The "Save the Graphic" option on the Termination Selection Screen of the graphics creation module allows you to create a permanent SAS graphics catalog and to store graphics output in it. To redisplay, merge graphics, remap colors, or otherwise manipulate the stored graphics, you must run the SAS GREPLAY procedure. GREPLAY may be run from the TSO Ready prompt by executing the SAS CLIST and subsequently submitting PROC GREPLAY to the system with the proper parameters. The Graphics Catalog management section of the UAMPPS allows you a "shortcut" to access PROC GREPLAY from the UAMPPS menu system.

Graphics Catalog: Catalog Management Menu Screen

```
UAMPPS 3.0
                    Graphic Catalog Management Menu

        Please enter below the Fully Qualified Data Set Name
        of the Graphics Catalog to be created or modified.

        Do not enclose the Data Set Name in Quotes.

   Graphics Catalog DSN:  uidacct.UAM.OAOPS.GCATLG

   Graphics Device      :  IBM3179

    PF1/PF13=Help        PF3/PF15=Prev Menu        PF4/PF16=Main Menu
```

If you choose the "Graphics Catalog" block on the main menu, you will find yourself in the above screen. This screen is intended to be a quick way for you to access PROC GREPLAY from within the UAMPPS. You may create a graphics catalog from this screen or access any existing one.

Instructions:

Enter the fully qualified data set name for the Graphics Catalog. (Do not confuse this data set name with the extracted UAM data sets.)

Also, enter your graphics device.

When you press [Enter], the screen will clear and the next screen displayed will be the PROC GREPLAY screen.

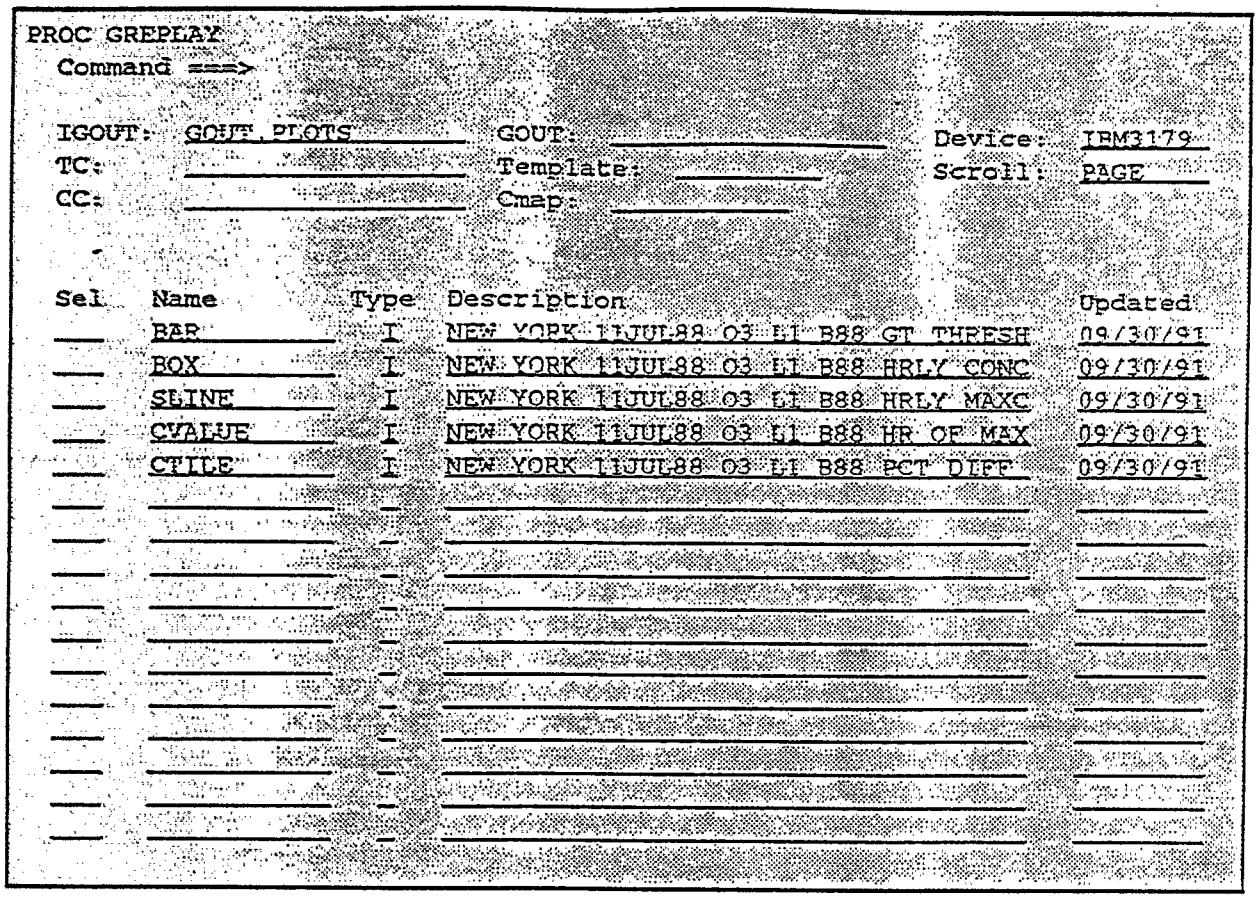
When you have finished using PROC GREPLAY, press [PF15] to return to the main menu.

Error Messages:

None.

4. SCREEN

Graphics Catalog: GREPLAY Screen



Field:	*Description:*
"IGOUT"	The name of the input catalog (the catalog currently displayed).
"GOUT"	The name of the output catalog (the catalog to which the graphic will be replayed or copied).
"Device"	The graphics device on which the graphic will be displayed (generally the current graphics device).
"TC"	The template catalog containing the template to be used when displaying the graphic (leave blank if no template is used).
"Template"	The name of the template to be used to display the graphic (leave blank if no template is used).
"Scroll"	The current scroll value for an entry list greater than one screen in length.
"CC"	The color map catalog from which the color map is drawn.
"Cmap"	The name of the color map used to display the graphic (leave blank if no color map is used).
"Sel"	The selection field; used to enter commands that apply to the corresponding catalog entry.

Graphics Catalog: GREPLAY Screen (concluded)

Field:	*Description:*
"Name"	The name that was assigned to the graphic by the "Name" field on the Graphics Catalog Generation screen.
"Type"	The type of graphics output. See Chapter 3 of SAS/GRAPH Reference for more information.
"Description"	The description that was assigned to the graphic by the "Description" field on the Graphics Catalog Generation screen.
"Updated"	The date that the catalog entry was generated.

Instructions:

Display a graphic:

Place an S in the "Sel" field and press Enter.

Delete a graphic:

Enter **DEL** in the "Sel" field and press Enter.

Copy a graphic:

Place a C in the "Sel" field and press Enter. The graphic entry will be copied to the catalog specified in the "GOUT" field.

Display a graphic (or graphics) in a template:

Enter a template catalog name in the "TC" field and the name of the template in the "Template" field.

Next select the graphic (or graphics) from the catalog list by placing an S and a number (or numbers, i.e. S1, S2, etc.) in the "Sel" field(s) indicating the order in which to display the graphics in the template. Press Enter.

Change the colors in a graphic:

Enter a color map catalog name in the "CC" field and the name of the color map in the "Cmap" field.

Next select the graphic from the catalog list by placing an S in the selection field. Press Enter.

Create or edit a template:

Enter a template catalog name in the "TC" field.

On the command line type: **edit templatename.TEMPLATE**, then press Enter. The TEMPLATE DESIGN window will be displayed for editing of the template. See SAS/GRAPH Reference (pages 1241-1244) for additional information on the TEMPLATE DESIGN window.

Create or edit a color map:

Enter a color map catalog name in the "CC" field.

On the command line type: **edit colormapname.CMAP**, then press Enter. The COLOR MAPPING window will be displayed for editing of the color map. See SAS/GRAPH Reference (pages 1244-1245) for additional information on the COLOR MAPPING window.

Change the current catalog:

Enter the new catalog name in the "IGOUT" field and press Enter. The new catalog list will be displayed.

TECHNICAL REPORT DATA

(Please read Instructions on reverse before completing)

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16. ABSTRACT

The UAM Quality Assurance System (UAMQAS) is a data display and analysis tool for input data to the UAM core model. The UAMQAS enables users to graphically display UAM input data and print the extracted information in tabular form. The UAMQAS provides an automated method of displaying data from any of nine UAM input files: AIRQUALITY, DIFFBREAK, EMISSIONS, METSCALARS, REGIONTOP, TMEPERATUR, TERRAIN, TOPCONC, and WIND. The UAMQAS creates time series plots, tile maps, wind vector charts, and three dimensional bubble plots. Through a series of menus the user has a wide range of flexibility in scaling and labeling the displays.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/ Group
Urban Airshed Model (UAM) species, layer, diffusion break, wind vector, SAS graphics catalog, bubble plots		

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